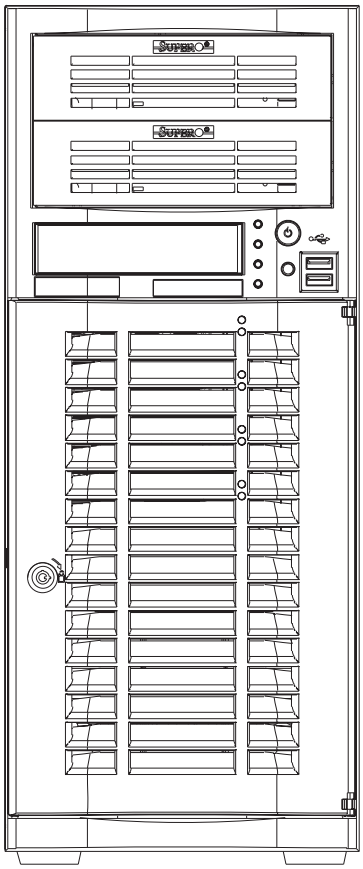
SUPERO®

SuperWorkstation 5035B-T



USER'S MANUAL

Revision 1.0a

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WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

Manual Revision 1.0a

Release Date: January 7, 2008

Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperWorkstation 5035B-T. Installation and maintenance should be performed by experienced technicians only.

The SuperWorkstation 5035B-T is a single processor system based on the SC733TQ-465 mid-tower chassis and the Super C2SBX serverboard. The C2SBX supports a single Intel® Core™2 Extreme, Quad or Dual processor - please refer to our web site for an up-to-date list of supported processors.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the system and describes the main features of the Super C2SBX serverboard and the SC733TQ-465 chassis.

Chapter 2: Installation

This chapter describes the steps necessary to setup the system. If your workstation was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer to this chapter for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperWorkstation 5035B-T.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the C2SBX serverboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC733TQ-465 mid-tower chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring Serial ATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS POST Messages

Appendix B: BIOS POST Codes

Appendix C: HostRAID Setup

Appendix D: Software Installation

Appendix E: System Specifications

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Appendix A BIOS POST Messages

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Chapter 1

Introduction

1-1 Overview

The SuperWorkstation 5035B-T is a high-end workstation comprised of two main subsystems: the SC733TQ-465 mid-tower chassis and the C2SBX serverboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperWorkstation 5035B-T (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the SuperWorkstation 5035B-T, as listed below:

- One (1) cooling fan (FAN-0060L)
- One (1) I/O backplate (MCP-260-00001-00)
- One (1) SGPIO cable (CBL-0157L)
- SATA Accessories
  One (1) SATA backplane (CSE-SAS-733TQ)
  Four (4) SATA cables (CBL-0061L)
- One (1) SuperWorkstation 5035B-T User's Manual

Note: heat sinks are not included. The recommended heat sink is Supermicro p/n SNK-P0015A4.

1-2 Serverboard Features

At the heart of the SuperWorkstation 5035B-T lies the C2SBX, a single processor serverboard based on the Intel X38 chipset. Below are the main features of the C2SBX. (See Figure 1-1 for a block diagram of the X38 chipset).

Processors

The C2SBX supports a single Intel Core™2 Extreme, Quad or Dual processor. Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The C2SBX has four 240-pin DIMM slots that can support up to 8 GB of non-ECC unbuffered DDR3-1333/1066/800 SDRAM. Single channel and dual-channel interleaved configurations are supported. Modules of the same size and speed should be used. See Chapter 5 for details.

Serial ATA

A SATA controller is integrated into the South Bridge (ICH9R) section of the chipset to provide a six-port Serial ATA subsystem, which is RAID 0, 1, 10 and 5 capable. The Serial ATA drives are hot-swappable units.

Note: The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the Serial ATA drives.

PCI Expansion Slots

The C2SBX has two PCI-E 2.0 x16 slots, one PCI-E x1 slot, two 64-bit PCI-X 133/100 MHz slots and two 32-bit PCI slots.

Onboard Controllers/Ports

One floppy drive controller and two onboard ATA/100 controllers are provided to support up to two IDE hard drives or ATAPI devices (one IDE connection is reserved for a Compact Flash card). The color-coded I/O ports include two COM ports, six USB 2.0 ports, PS/2 mouse and keyboard ports, one Gb Ethernet port and six HDA (High Definition Audio) ports.

Other Features

Other onboard features that promote system health include onboard voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

1-3 Chassis Features

The following is a general outline of the main features of the SC733TQ-465 workstation chassis.

System Power

The SC733TQ-465 features a low-noise, high-efficiency 465W power supply. Power must be removed from the system before servicing or replacing the power supply.

SATA Subsystem

The SC733TQ-465 chassis was designed to support four SATA hard drives, which are hot-swappable units.

Front Control Panel

The control panel on the SuperWorkstation 5035B-T provides you with system monitoring and control. LEDs indicate power on, network activity, hard disk drive activity and overheat conditions. The control panel also includes a main power button and a system reset button.

I/O Backplane

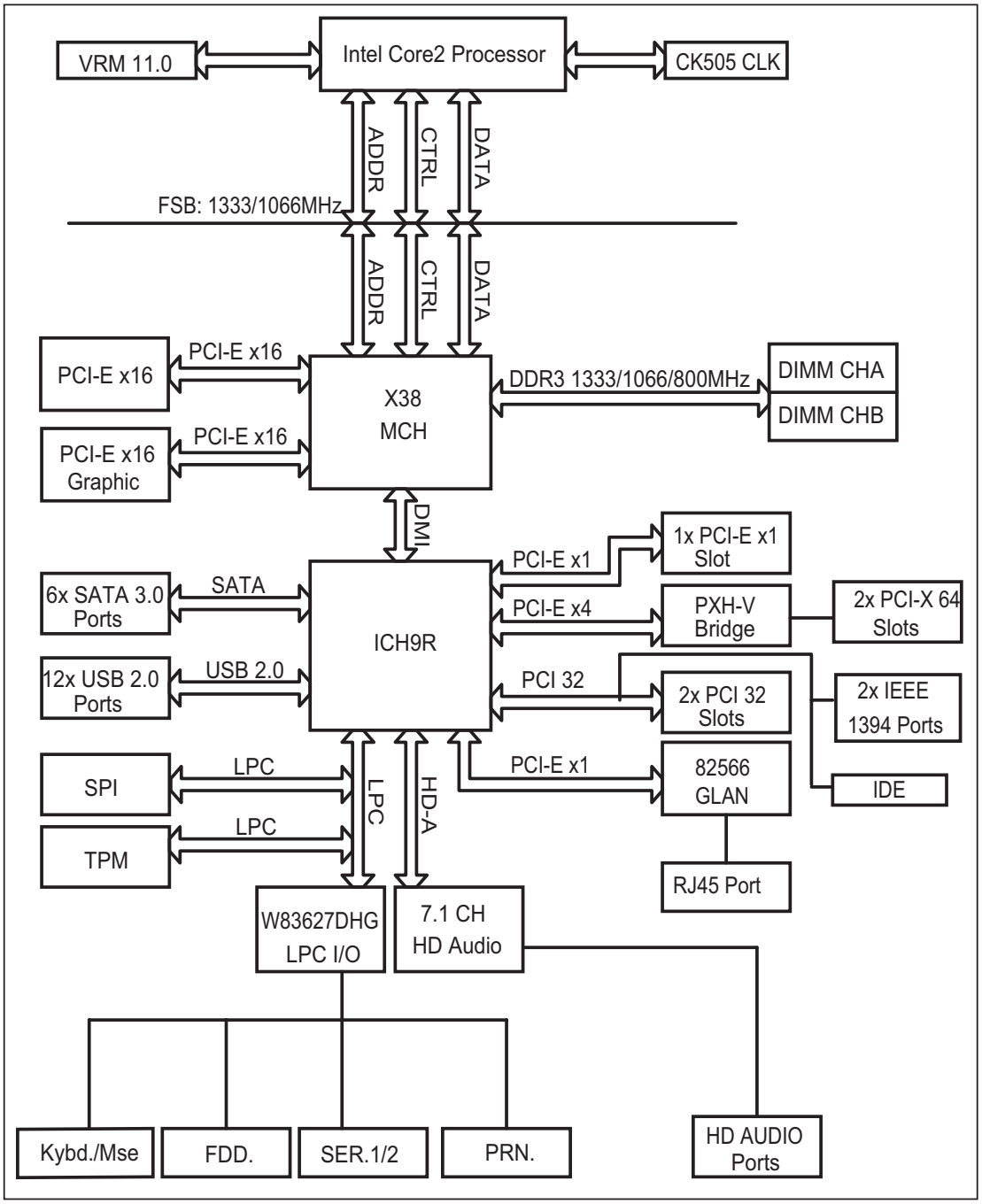
The SC733TQ-465 is a mid-tower chassis designed to be used as a workstation platform. The I/O backplane includes two COM ports, six USB 2.0 ports, PS/2 mouse and keyboard ports, one gigabit Ethernet port, one IEEE 1394 (Firewire) port (which occupies one PCI slot) and HDA audio ports. Seven standard size PCI expansion cards may be added to the system.

Cooling System

The SC733TQ-465 chassis one 9-cm fan located at the front of the chassis and a 12-cm fan located in the power supply. Both fans operate continuously. An optional exhaust fan (FAN-0055) may also be installed for increased airflow if needed.

Figure 1-1. Intel X38 Chipset:
System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.



1-4 Contacting Supermicro

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Web Site:	www.supermicro.com.tw
Technical Support:	
Email:	support@supermicro.com.tw
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Notes

Chapter 2

System Setup

2-1 Overview

This chapter provides a quick setup checklist to get your SuperWorkstation 5035B-T up and running. Following the steps in the order given should enable you to have the system operational within a minimal amount of time. If your system is not already fully integrated with a motherboard, processor, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperWorkstation 5035B-T was shipped in and note if it was damaged in any way. If the workstation itself shows damage, you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for setting up and operating the SuperWorkstation 5035B-T. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet.

Once the SuperWorkstation 5035B-T is placed in the appropriate location, slide the locking tabs on each caster down to keep it stationary.

Warnings and Precautions!

- Ensure that the caster wheels on the workstation are locked.
- Review the electrical and general safety precautions in Chapter 4.
- Use a regulating uninterruptible power supply (UPS) to protect the workstation from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the power supply units and hot-swap Serial ATA drive to cool before touching them.

- To maintain proper cooling, always keep all chassis panels closed and all SATA carriers installed when not being serviced.

2-3 Setting Up the System

You should first open the left side panel (when facing the front of the chassis) to make sure the motherboard is properly installed and all connections have been made.

Checking the Motherboard Setup

1. Accessing the inside of the system (Figure 2-1): Begin by removing the two screws from the back lip of the side cover (this is the left cover when looking at the chassis from the front.) Grab the handle and gently pull the side cover out to release it from its position. Once the side cover is out of its position, slide the cover out of the chassis.

2. Check the CPU (processor): You may have one processor already installed into the system board. The processor should have its own heatsink attached. See Chapter 5 for instructions on processor installation.

3. Check the system memory: Your system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

4. Installing add-on cards: If desired, you can install up to seven add-on cards to the system. See Chapter 5 for details on installing PCI-E/PCI-X/PCI add-on cards.

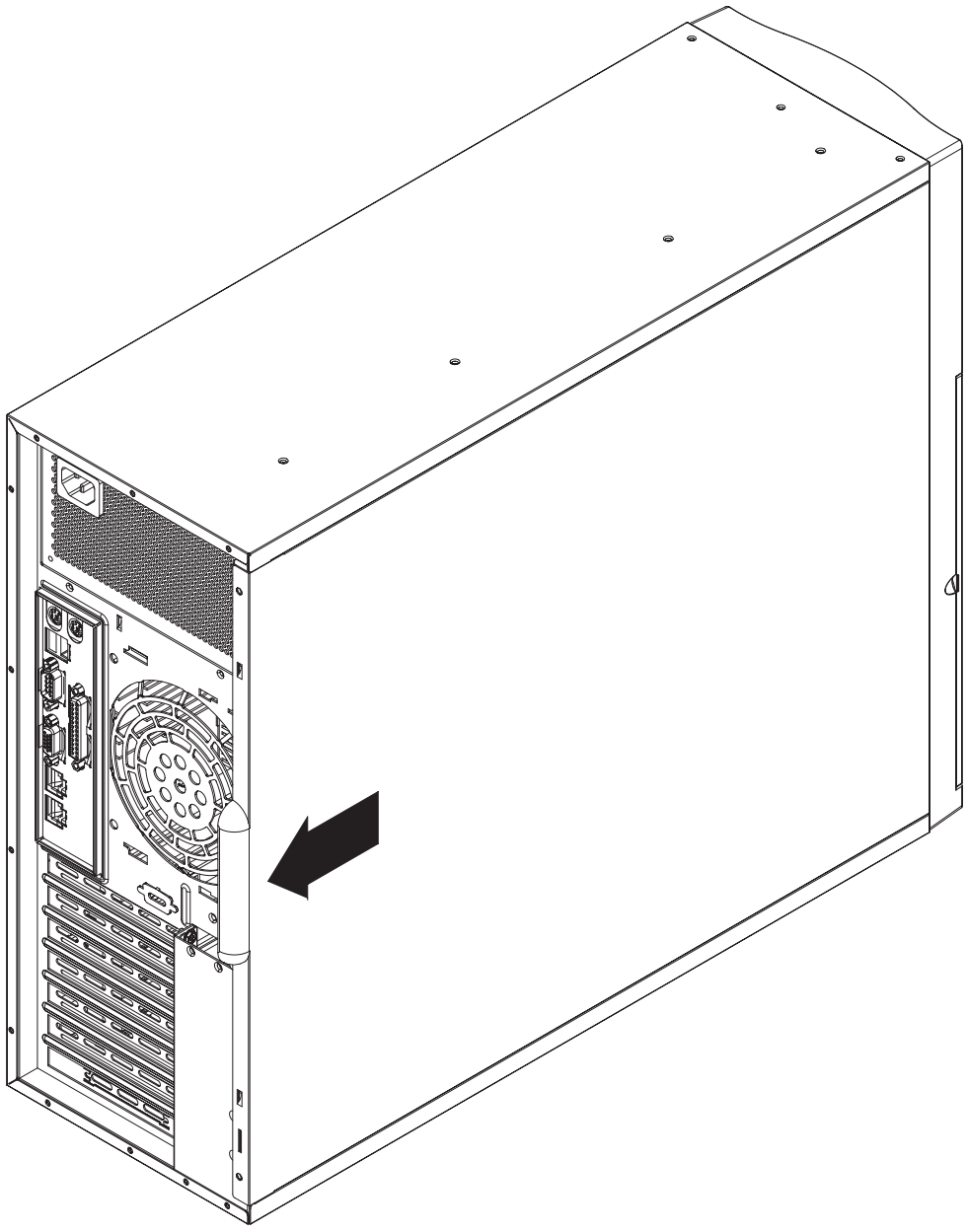
5. Check all cable connections and airflow: Make sure all power and data cables are properly connected and not blocking the airflow. See Chapter 5 for details on cable connections.

Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the Serial ATA drive and Serial ATA backplane have been properly installed and all essential connections have been made.

1. Accessing the peripheral drive bays: To install or remove a component in the 3.5" and/or 5.25" drive bay(s), you will need to remove the side chassis cover.

Figure 2-1. Accessing the Inside of the 5035B-T



See the installation and removal sections for the peripheral drives in Chapter 6.

2. Check the Serial ATA disk drives: Depending upon your system's configuration, your system may have up to four Serial ATA drives already installed. If you need to install or remove an SATA drive, please refer to the appropriate section in Chapter 6.

3. Check the airflow: Cooling air is provided by a 9-cm internal cooling fan and a 12-cm fan that is built in to the power supply. The system component layout was carefully designed to promote sufficient airflow throughout the chassis. Also note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fan. Please keep this in mind when rerouting or adding/removing cables.

4. Supplying power to the system: The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

Chapter 3

System Interface

3-1 Overview

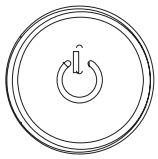
There are several LEDs on the control panel and one on each Serial ATA drive carrier to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel. This chapter explains the meanings of all LED indicators and any appropriate response you may need to take.

3-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis. These are (in order from left to right) a reset button and a power on/off button.

RESET

The reset button reboots the system.



POWER

This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC733TQ-465B chassis has four LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

Power

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

HDD

Channel activity for all HDDs. This light indicates SATA drive activity when flashing.

NIC

Indicates network activity on the Gigabit LAN when flashing.

Overheat/Fan Fail

When this LED flashes it indicates a fan failure. When on continuously (on and not flashing) it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm.

Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the overheat condition exists.

3-4 Serial ATA Drive Carrier LEDs

Each Serial ATA drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the SATA drive carrier indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.

- **Red:** The red LED indicates two states. When blinking, it indicates the drive is rebuilding. When solid, it indicates a drive failure. If a SATA drive fails, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Note: power should always be disconnected before performing any service on the system.

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 5035B-T from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and floppy drive. When disconnecting power, you should first power down the system with the operating system first and then unplug the power cords of all the power supply units in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the SuperServer 5035B-T clean and free of clutter.

- The SuperServer 5035B-T weighs approximately 43 lbs. (19.5 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

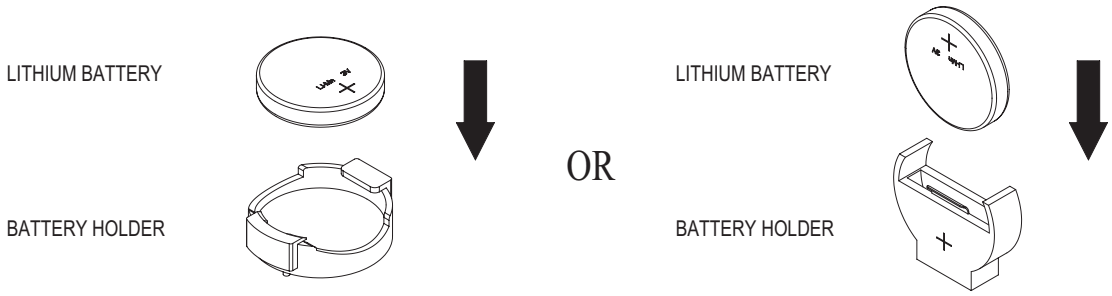
Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 5035B-T is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install the C2SBX serverboard into the chassis, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the serverboard to better cool and protect the system.

5-1 Handling the Serverboard

Electrostatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

- Use a grounded wrist strap designed to prevent Electrostatic Discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

5-2 Serverboard Installation

This section explains the first step of physically mounting the C2SBX into the SC733TQ-465 chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the serverboard, follow the procedure in reverse order.

Installing to the Chassis

1. Access the inside of the system by removing the screws from the back lip of the top cover of the chassis, then pull the cover off.

2. The C2SBX requires a chassis big enough to support a 12" x 9.6" serverboard, such as Supermicro's SC733TQ-465.

3. Make sure that the I/O ports on the serverboard align properly with their respective holes in the I/O shield at the back of the chassis.

4. Carefully mount the serverboard to the serverboard tray by aligning the board holes with the raised metal standoffs that are visible in the chassis.

5. Insert screws into all the mounting holes on your serverboard that line up with the standoffs and tighten until snug (if you screw them in too tight, you might strip the threads). Metal screws provide an electrical contact to the serverboard ground to provide a continuous ground for the system.

6. Finish by replacing the top cover of the chassis.

5-3 Connecting Cables

Now that the serverboard is installed, the next step is to connect the cables to the board. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-9 for connector locations.)

- SATA drive data cable (I-SATA0 ~ I-SATA3)
- Control Panel cable (JF1)
- SGPIO cable (SGPIO1)

Important! Make sure the the cables do not come into contact with the fans.

Connecting Power Cables

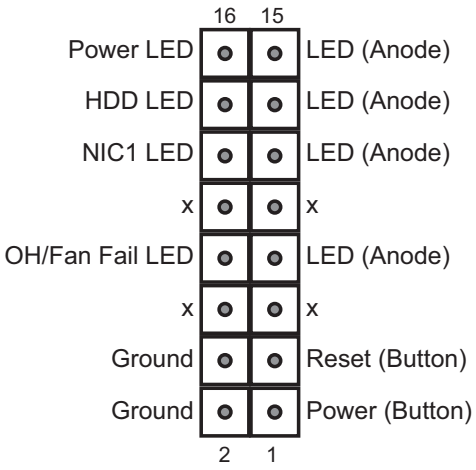
The C2SBX has a 24-pin primary power supply connector (J40) for connection to the ATX power supply. In addition, a 4-pin auxilliary power connector (J41) and an 8-pin processor power connector (J42) must also be connected to your power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators.

All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Chapter 5 for details and pin descriptions.

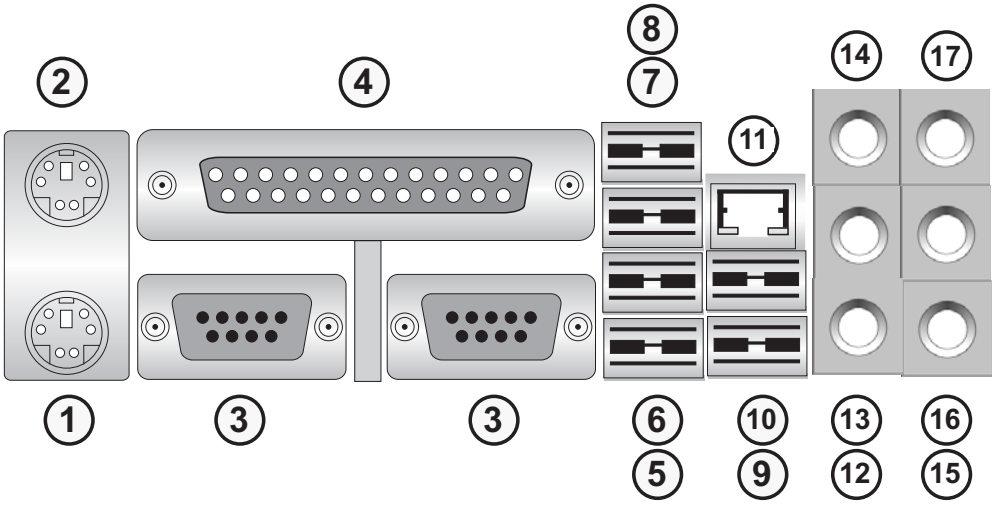
Figure 5-1. Control Panel Header Pins



5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. I/O Ports



I/O Port Definitions			
1	PS/2 Keyboard	10	Back Panel USB Port 1
2	PS/2 Mouse	11	Gigabit LAN Port
3	COM Ports 1/2	12	Side Speaker (Gray)
4	Parallel (Printer) Port	13	Rear Speaker (Black)
5	Back Panel USB Port 2	14	Center/Subwoofer (Orange)
6	Back Panel USB Port 3	15	Mic In (Pink)
7	Back Panel USB Port 4	16	Front Speaker (Lime)
8	Back Panel USB Port 5	17	Line In (Light Blue)
9	Back Panel USB Port 0		

5-5 Installing the Processor and Heat Sink

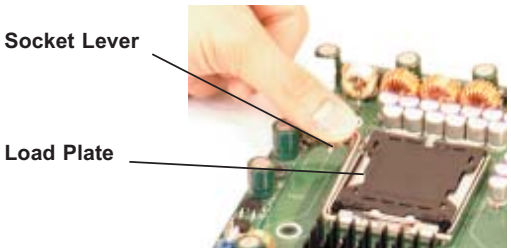
Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

Notes

- Install the serverboard into the chassis before you install the CPU heat sink and fan.
- The Intel LGA775 processor package contains a CPU fan and heat sink assembly. If you buy a CPU separately, make sure that you use only an Intel-certified multi-directional heat sink and fan.
- Install the serverboard into the chassis before you install the CPU heat sink and fan.
- When purchasing an LGA775 processor or when receiving a motherboard with an LGA775 processor pre-installed, make sure that the CPU plastic cap is in place and that none of the CPU pins are bent, otherwise, contact the retailer immediately.

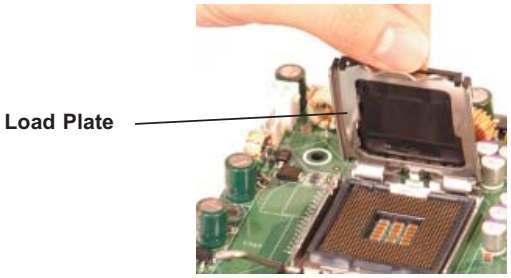
Installing the Processor

1. Press the socket lever to release the load plate that covers the CPU socket from its locking position.

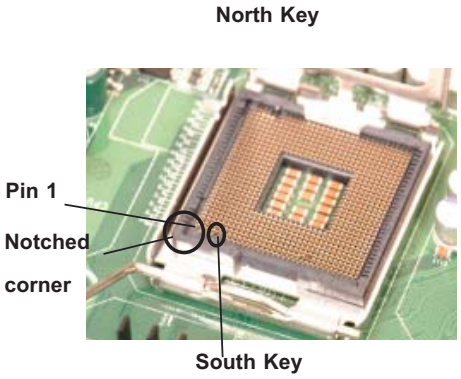


CPU socket (with load plate)

2. Carefully lift the socket lever up to open the load plate.

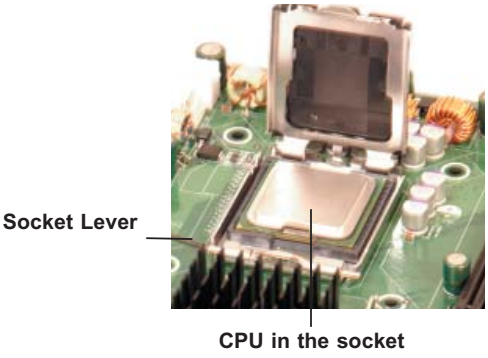


3. Locate Pin 1 on the CPU socket. (Pin 1 is closest to the notched corner of the housing.) Please note that a North key and a South key (notches) are located at opposite sides of the CPU housing.



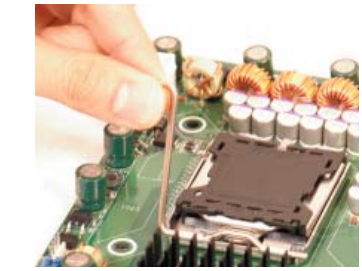
4. Use your thumb and index finger to hold the CPU at the north center and south center edges of the CPU.

5. Align Pin 1 of the CPU with Pin 1 of the socket. Once aligned, carefully lower the CPU straight down and into the socket. *Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface of the socket or against any pins of the socket, which may damage the CPU and/or the socket.*



6. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.

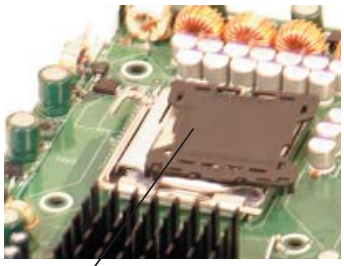
7. Use your thumb to gently press the lever down and lock it in the hook.



8. If the CPU is properly installed into the socket, the black plastic cover will be automatically released from the load plate when the lever is pushed into the hook. Remove the cover from the motherboard.

Note: Keep the plastic cap. If you need to ship the motherboard, the CPU must have the plastic cap properly installed to protect the CPU pins. Shipping without the CPU plastic cap properly installed will void the warranty.

Step 8



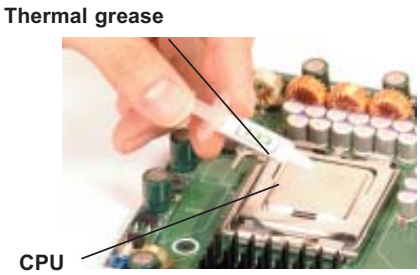
Plastic cap is released from the load plate when the CPU is properly installed.

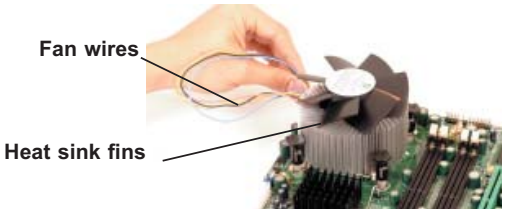
Warning! Make sure you lift the lever completely when installing the CPU; otherwise, damage to the socket or CPU may occur.

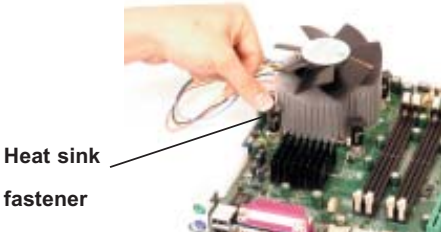
Installing the Heat Sink

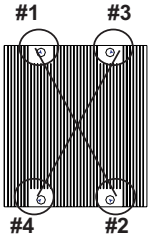
1. Locate the CPU fan on the motherboard. (Refer to the layout on the right for the CPU fan location.)
2. Position the heat sink in such a way that the heat sink fan wires are closest to the CPU fan and are not interfering with other components.
3. Inspect the CPU fan wires to make sure the wires are routed through the bottom of the heat sink.
4. Remove the thin layer of protective film from the copper core of the heat sink. **(Note**: the CPU may overheat if the protective film is not removed from the heat sink.) Apply the proper amount of thermal grease to the CPU. If your heat sink came with a thermal pad, please ignore this step. If necessary, rearrange the wires to make sure that they are not pinched between the heat sink and the CPU. Also make sure to keep clearance between the fan wires and the fins of the heat sink.
5. Align the four heat sink fasteners with the mounting holes on the motherboard.
6. Gently push the pairs of diagonal fasteners (#1 & #2 and #3 & #4) into the mounting holes until you hear a click. **Note**: Make sure to orient each fastener so that the narrow end of the groove is pointing outward.
7. Repeat step 6 to insert all four heat sink fasteners into the mounting holes.

Note: the heat sink for the 5035B-T (SNK-P0015A4) is an optional component.









Removing the Heat Sink

1. Unplug the power cord from the power supply.
2. Disconnect the heat sink fan wires from the CPU fan header.
3. Use your finger tips to gently press on the fastener cap and turn it counter-clockwise to make a 1/4 (90^0) turn, then pull the fastener upward to loosen it.
4. Repeat step 3 to loosen all fasteners from the mounting holes, then remove the heat sink from the CPU.

5-6 Installing Memory

CAUTION! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

Note: Check the Supermicro web site for recommended memory modules.

DIMM Installation

1. Insert the desired number of DIMMs into the memory slots, starting with DIMM1A. For an interleaved memory scheme, install two modules at a time beginning with DIMM1A and DIMM1B (the blue slots) then DIMM2A and DIMM2B
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the module incorrectly (see Figure 5-3).
3. Gently press down on the module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

Memory Support

The C2SBX supports up to 8 GB of unbuffered non-ECC DDR3-1333/1066/800 in 4 slots. Populating DIMM A and DIMM 1B and DIMM 2A and DIMM 2B with memory modules of the same size and type will result in dual channel interleaved memory, which is faster than the single channel non-interleaved memory.

Notes:

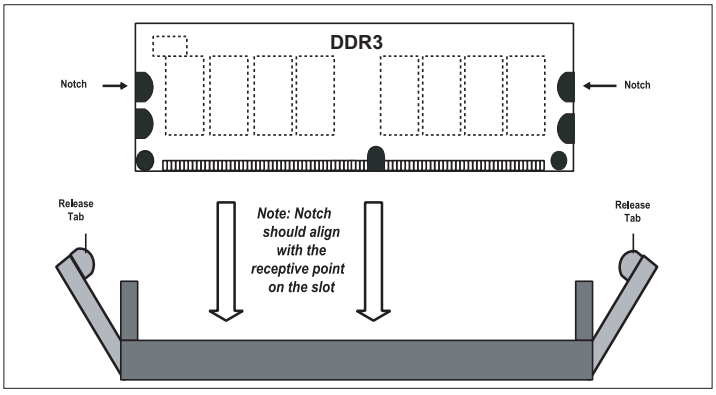
- Due to the OS limitations, some operating systems may not show more than 4 GB of memory.

- Due to allocating memory to system devices, memory remaining available for operational use will be reduced when 4 GB of SDRAM is used. The reduction in memory availability is disproportional. (Refer to the following Memory Availability Table for details.)

Memory Availability		
System Device	Size	Physical Memory Remaining (Available) (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99
Local APIC	4 KB	3.99
Area Reserved for the chipset	2 MB	3.99
I/O APIC (4 Kbytes)	4 KB	3.99
PCI Enumeration Area 1	256 MB	3.76
PCI Express (256 MB)	256 MB	3.51
PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary-	512 MB	3.01
VGA Memory	16 MB	2.85
TSEG	1 MB	2.84
Memory available to OS and other applications		2.84

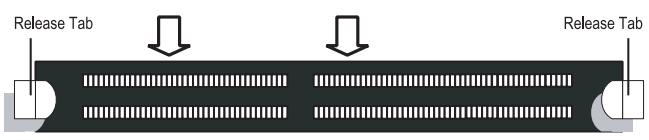
Figure 5-3. DIMM Installation

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notches.



To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

Top View of DDR3 Slot



5-7 Adding PCI Add-On Cards

The 5035B-T can accommodate standard size add-on cards in all slots on the C2SBX serverboard.

Installing an Add-on Card

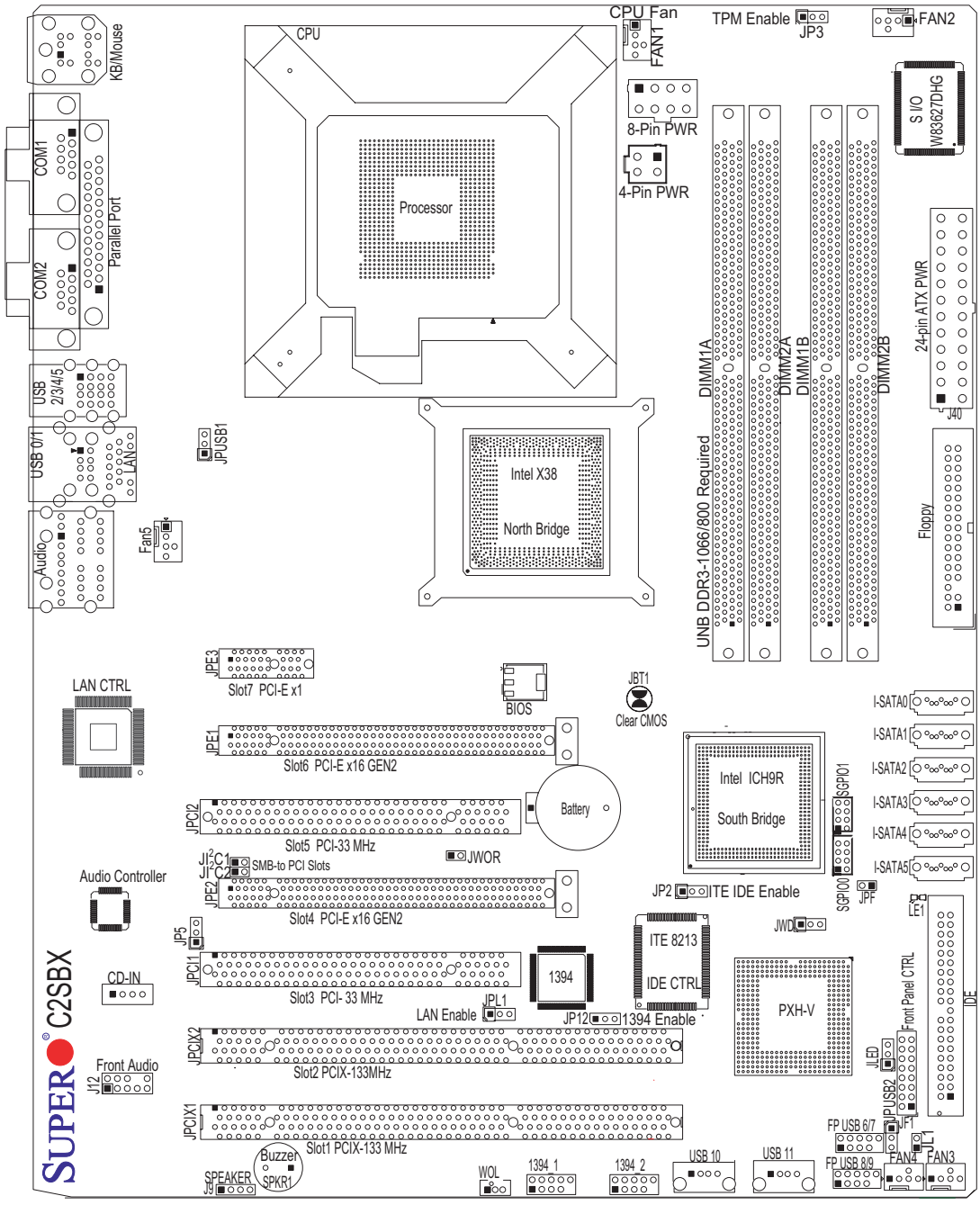
1. Begin by removing the PCI slot shield for the slot you wish to populate.

2. Fully seat the card into the riser card slot, pushing down with your thumbs evenly on both sides of the card.

3. Finish by using a screw to secure the top of the card shield to the chassis. The PCI slot shields protect the serverboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused slot.

5-8 Serverboard Details

Figure 5-4. C2SBX Layout



C2SBX Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	(See Section 5-10)
JI²C1/JI²C2	SMB to PCI Slots Enable/Disable	Both Open (Disabled)
JP2	ITE IDE Enable/Disable	Pins 1-2 (Enabled)
JP3	TPM Enable/Disable	Pins 1-2 (Enabled)
JP5	Audio Enable/Disable	Pins 1-2 (Enabled)
JP12	EEE 1394 Enable/Disable	Pins 1-2 (Enabled)
JPL1	GLAN1 Enable/Disable	Pins 1-2 (Enabled)
JPF	Power Force-On	Open (Normal)
JPUSB1/2	USB Wakeup Enable/Disable	Both Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1-2 (Reset)

Connector	Description
1394_1/1394_2	IEEE 1394 (Firewire) Headers
Audio FP	Front Panel Audio Connector
CD_IN	Audio CD Input Header
COM1/COM2	COM1/2 Serial Ports
Fan 1-5	Fan1: CPU Fan; Fans 2-5: Chassis Fan Headers
Floppy	Floppy Disk Drive Connector
GLAN	Gigabit Ethernet (RJ45) Port
IDE	IDE Drive
I-SATA0 ~ I-SATA5	Serial ATA Ports
J9	Speaker Jumper/Header
J40	24-pin ATX Power Connector
J41	4-pin Auxilliary Power Connector
J42	8-Pin Processor Power Connectors
JF1	Front Panel Header
JL1	Chassis Intrusion Header
JWOR	Wake-On-Ring Header
SGPIO1/SGPIO2	Serial General Purpose I/O Headers (for SATA)
USB6/7/8/9	Front Panel USB Headers
USB10/11	Onboard USB Ports
WOL	Wake-On-LAN Header

LEDs	Description
JLED	Onboard Power LED Indicator
LE1	Standby Power LED Indicator

5-9 Connector Definitions

Main ATX Power Supply Connector

The primary power supply connector (JPW1) meets the SSI (Superset ATX) 24-pin specification. Refer to the table on the right for the pin definitions of the ATX 24-pin power connector. You must also connect the 8-pin (J42) and 4-pin power connectors to your power supply (see below).

ATX Power 24-pin Connector Pin Definitions (JPW1)

Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Auxilliary Power Connector

J41 must also be connected to the power supply to provide auxilliary power. See the table at right for pin definitions.

4-pin Auxilliary Power Pin Definitions (J41)

Pins	Definition
1 and 2	Ground
3 and 4	+12V

Required Connection

Processor Power Connector

J42 must also be connected to the power supply to provide power for the processors. See the table on the right for pin definitions.

8-pin (+12V) Processor Power Pin Definitions (J42)

Pins	Definition
1 - 4	Ground
5 - 8	+12V

Required Connection

Power Button

The connection for the power button is on pins 1 and 2 of JF1. The chassis power button should be connected here. See the table on the right for pin definitions.

Power Button Pin Definitions (JF1)

Pin#	Definition
1	PW_ON
2	Ground

Reset Connector

The reset header is located on pins 3 and 4 of JF1. Attach the reset switch on the computer chassis to these pins. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)

Pin#	Definition
3	Reset
4	Ground

Overheat/Fan Fail LED (OH)

Connect an LED to pins 7 and 8 of JF1 to provide advanced warning of chassis overheating or fan failure. Refer to the table on the right for pin definitions.

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	Ground

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flash-ing	Fan Fail

NIC1 (GLAN) LED

The LED connections for the GB LAN port are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)	
Pin#	Definition
11	Vcc
12	Ground

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. This LED is used to display all IDE and SATA activity. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	Vcc
14	HD Active

Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1 (use JLED for a 3-pin connector). This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	5V Stby
16	Control

Chassis Intrusion

The Chassis Intrusion header is designated JL1. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on the I/O back-panel. The mouse port is above the keyboard port. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions

Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Fan Headers

The C2SBX has five fan headers, all of which are 4-pin fans. However, pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans. See the table on the right for pin definitions. The onboard fan speeds are controlled by Thermal Management (via Hardware Monitoring) under the Advanced Section in the BIOS. The default is disabled. When using Thermal Management setting, please use all 3-pin fans or all 4-pin fans.

Fan Header Pin Definitions (FAN1-5)

Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

GLAN (Ethernet Port)

One Ethernet port (designated GLAN) is located beside the COM port on the I/O backplane. This port accepts RJ45 type cables.

Wake-On-LAN

The Wake-On-LAN header is designated WOL on the serverboard. See the table on the right for pin definitions. You must also have a LAN card with a Wake-On-LAN connector and cable to use this feature.

Wake-On-LAN Pin Definitions (WOL)

Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and be "awakened" by an incoming call when in the suspend state. See the table on the right for pin definitions. You must also have a WOR card and cable to use this feature.

Wake-On-Ring Pin Definitions (JWOR)

Pin#	Definition
1	Ground (Black)
2	Wake-up

Speaker

A speaker header is located at J9. See the table on the right for pin definitions. **Note**: The speaker header pins are for use with an external speaker. If you wish to use the onboard speaker, you need to close pins 3-4 with a jumper.

Speaker Header/Jumper Pin Definitions (J9)

Pin Setting	Definition
Pins 3-4	Internal Speaker
Pins 1-4	External Speaker

Serial Ports

Two serial ports are included on the backpanel of the C2SBX. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1/COM2)

Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

SGPIO Header

Two SGPIO (Serial General Purpose Input/Output) headers are designated SGPIO1 and SGPIO2. These headers are used to communicate with a system-monitoring chip on the backplane. See the table on the right for pin definitions.

SGPIO Header Pin Definitions (SGPIO1/SGPIO2)

Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	NC

NC = No Connection

Power LED

The Power LED connector is designated JLED. This connection is used to indicate that power is supplied to the system. See the table on the right for pin definitions.

PWR LED Pin Definitions

Pin#	Definition
1	+5V
2	Key
3	Ground

CD and Audio FP

A 4-pin CD header (CD_IN) and an auxiliary header (Audio FP) allow you to use the onboard sound for audio CD playback. Connect an audio cable from your CD drive to the header that fits your cable's connector. Only one header can be used at any one time. See the tables at right for pin definitions.

Audio Input CD Header Pin Definitions (CD_IN)

Pin#	Definition
1	Left Stereo Signal
2	Ground
3	Ground
4	Right Stereo Signal

Front Panel Audio Control

When front panel headphones are plugged in, the back panel audio output is disabled. This is done through the FP Audio header (Audio FP). If the front panel interface card is not connected to the front panel audio header, jumpers should be installed on pin pairs 1-2, 5-6, and 9-10 of the Audio FP header. If these jumpers are not installed, the back panel line out connector will be disabled, and pin 1 of the microphone in will be left floating, which can lead to excessive back panel microphone noise and crosstalk. See the table at right for pin definitions.

Front Panel Audio Pin Definitions (Audio FP)

Pin#	Definition
1	MIC_L
2	Audio Ground
3	MIC_R
4	FP Audio Detect
5	Line_2_R
6	Ground
7	FP_Jack Detect
8	Key
9	Line_2_L
10	Ground

IEEE 1394 Connection

Connectors 1394_1 and 1394_2 provide connectivity for IEEE 1394 (Firewire) devices. See the tables on the right for pin definitions.

1394_1 Pin Definitions

Pin#	Defin.	Pin#	Defin
1	PTPA0+	2	PTPA0-
3	GND	4	GND
5	PTPB0+	6	PTPB0-
7	PWR 1394	8	PWR 1394
		10	ZX

1394_2 Pin Definitions

Pin#	Defin.	Pin#	Defin
1	PTPA1+	2	PTPA1-
3	GND	4	GND
5	PTPB1+	6	PTPB1-
7	PWR 1394	8	PWR 1394
		10	ZY

Universal Serial Bus (USB)

There are 12 Universal Serial Bus (USB2.0) ports/headers on the C2SBX. Six of them are back panel USB ports: USB 0/1/2/3/4/5. In addition, four headers are provided for USB 6/7 and USB 8/9 for front panel use. USB 10 and USB 11 are onboard ports that can be accessed from the front side of the chassis. See the tables on the right for pin definitions.

Back Panel USB Ports (USB0-5)

Pin#	Definitions
1	+5V
2	PO-
3	PO+
4	Ground
5	N/A

Front Panel (USB6-9) and Onboard Ports (USB10/11)

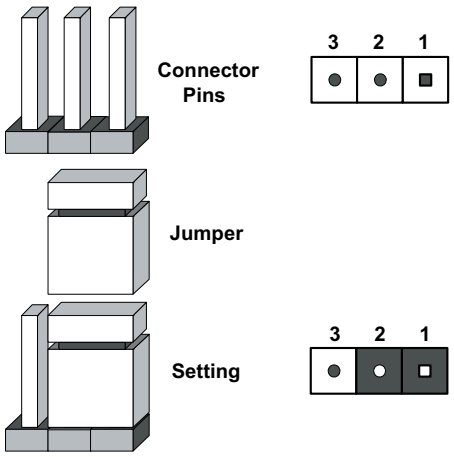
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	Key	5	No connection

5-10 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the serverboard layout pages for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS,

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS*.

GLAN1 Enable/Disable

Change the setting of jumper JPL1 to enable or disable the GLAN1 Ethernet port on the serverboard. See the table on the right for jumper settings. The default setting is enabled.

GLAN1 Enable/Disable Jumper Settings (JPL1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Audio Enable/Disable

JP5 enables or disables the onboard audio connections. See the table on the right for jumper settings. The default setting is Enabled.

Audio Enable/Disable Jumper Settings (JP5)	
Pin#	Definition
1-2	Enabled
2-3	Disabled

SMBus to PCI/PCI-E Slots

Jumpers JI^{2}C1 and JI^{2}C2 allow you to connect the PCI slots to the System Management Bus (I^{2}C). The default setting is Open to disable the connection. See the table on the right for jumper settings.

SMBus to PCI-X/PCI-Exp Slots Jumper Settings (JI^{2}C1/JI^{2}C2)		
JI^{2}C1	**JI^{2}C2**	**Setting**
Closed	Closed	Enabled
Open	Open	Disabled

IDE Controller Enable/Disable

JP2 enables or disables the onboard IDE controller (ITE8213). See the table on the right for jumper settings. The default setting is Enabled.

IDE Enable/Disable Jumper Settings (JP2)	
Pin#	Definition
1-2	Enabled (*default)
2-3	Disabled

TPM

Jumper JP3 allows you to enable TPM (Trusted Platform Module) if a processors that supports TPM is used in the system. The default setting is Enabled. See the table on the right for jumper settings. **Note:** You must enable TPM Support in the BIOS to use this feature.

TPM Enable/Disable Jumper Settings (JP3)	
Pin#	Definition
1-2	Enabled
2-3	Disabled

Watch Dog Enable/Disable

JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause WD to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Note: When enabled, the user needs to write their own application software in order to disable the Watch Dog Timer.

Watch Dog Jumper Settings (JWD)

Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

USB Wake-Up

Use the JPUSB1/2 jumpers to allow the system to be "Woken Up" via USB devices by pressing a key on the USB keyboard or by clicking the USB mouse of your system. These jumpers are used together with the USB Wake-Up function in the BIOS. Enable the jumper and the BIOS setting to use this feature. See the table on the right for jumper settings. **Note**: JPUSB1 is for Back Panel USB ports: 0/1/2/3/4/5, and JPUSB2 is for Front Panel USB ports: 6/7/8/9/10/11.

Note: JPUSB1 should be enabled by default to allow USB0 and BP USB1 to be woken up from standby states. However, the default jumper setting for the JPUSB2 is Disabled. When the USB Wake-Up feature is enabled in the BIOS and the selected USB ports are also enabled via the JPUSB jumpers, please be sure to remove all other USB devices from the USB ports whose USB jumpers are set to Disabled before the system goes into the standby mode.

USB Wake-Up Enable/ Disable Jumper Settings (JUSB1/JUSB2)

Pin#	Definition
1-2	Enabled
2-3	Disabled

Power Force On

Jumper JPF allows you to enable or disable the Power Force-On function. If enabled, the power will always stay on automatically. If this function is disabled (the normal setting), the user needs to press the power button to power on the system.

Power Force On Jumper Settings (JPF)	
Jumper Setting	Definition
Open	Normal (*default)
Closed	Force On

IEEE 1394 Enable

JP12 allows the user to enable the onboard IEEE 1394 headers. See the table on the right for jumper settings. The default setting is Enabled.

IEEE 1394 Enable/Disable Jumper Settings (JP12)	
Pin#	Definition
1-2	Enabled
2-3	Disabled

5-11 Onboard Indicators

GLAN1/2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each port, one LED indicates activity while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

GLAN1/2 LED (Connection Speed Indicator)	
LED Color	Definition
Off	10 MHz
Green	100 MHz
Amber	1 GHz

Onboard Power LED (LE1)

An Onboard Power LED is located at LE1. This LED Indicator is on when the system is on. Be sure to unplug the power cable before removing or adding any components. See the table on the right for more details.

Onboard PWR LED Indicator (LE1)	
LED State	Definition
Off	System Off
On	Standby Power On
Green	System On

5-12 Parallel, Floppy, IDE, and SATA Ports

Use the following information to connect the IDE hard disk drive cables.

- A red mark on a wire typically designates the location of pin 1.

- The 80-wire ATA100/66 IDE hard disk drive cable that came with your system has two connectors to support two drives. This special cable should be used to take advantage of the speed this new technology offers. The blue connector connects to the onboard IDE connector interface and the other connector(s) to your hard drive(s). Consult the documentation that came with your disk drive for details on actual jumper locations and settings for the hard disk drive.

Parallel (Printer) Port Connector

The parallel (printer) port is located on the I/O backplane. See the table on the right for pin definitions.

Parallel (Printer) Port Connector Pin Definitions

Pin#	Definition	Pin #	Definition
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	Write Data
23	PE	24	Write Gate
25	SLCT	26	NC

SATA Ports

There are no jumpers to configure the onboard SATA connectors. See the table on the right for pin definitions.

SATA Port Pin Definitions (I-SATA0 ~ I-SATA5)

Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

IDE Connector

An ITE IDE connector is designated "IDE" on the C2SBX. Be sure to close pins 1 and 2 of JP2 to enable the IDE controller before using this connector. (Please refer to the jumper section for more details.) See the table on the right for pin definitions.

IDE Drive Connector Pin Definitions (IDE)

Pin#	Definition	Pin #	Definition
1	Reset IDE	2	Ground
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	Ground	20	Key
21	DRQ3	22	Ground
23	I/O Write	24	Ground
25	I/O Read	26	Ground
27	IOCHRDY	28	BALE
29	DACK3	30	Ground
31	IRQ14	32	IOCS16
33	Addr1	34	Ground
35	Addr0	36	Addr2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	Ground

Floppy Connector

The floppy connector is designated "Floppy". See the table on the right for pin definitions.

Floppy Drive Connector Pin Definitions (Floppy)

Pin#	Definition	Pin #	Definition
1	Ground	2	FDHDIN
3	Ground	4	Reserved
5	Key	6	FDEDIN
7	Ground	8	Index
9	Ground	10	Motor Enable
11	Ground	12	Drive Select B
13	Ground	14	Drive Select B
15	Ground	16	Motor Enable
17	Ground	18	DIR
19	Ground	20	STEP
21	Ground	22	Write Data
23	Ground	24	Write Gate
25	Ground	26	Track 00
27	Ground	28	Write Protect
29	Ground	30	Read Data
31	Ground	32	Side 1 Select
33	Ground	34	Diskette

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform simple maintenance on the SC733TQ-465B chassis. Following the component installation steps in the order given will eliminate most common problems. If some steps are unnecessary, skip ahead to the next step.

Tools Required

The only tool you will need is a Philips screwdriver.

6-1 Static-Sensitive Devices

Static electrical discharge can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from static discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

The motherboard is shipped in antistatic packaging. When unpacking the board, make sure the person handling it is static protected.

6-2 Front Control Panel

The front control panel must be connected to the JF1 connector on the motherboard to provide you with system status and alarm indications. A ribbon cable has bundled these wires together to simplify this connection. Connect the cable from JF1 on the motherboard (making sure the red wire plugs into pin 1) to the appropriate comnnector on the front control panel PCB (printed circuit board). Pull all excess cabling over to the control panel side of the chassis.

The LEDs inform you of system status - see Figure 6-1 for details. Figure 6-2 shows the SC733TQ-465B features included on the front of the chassis. See Chapter 5 for details on JF1.

Figure 6-1. Front Control Panel LEDs

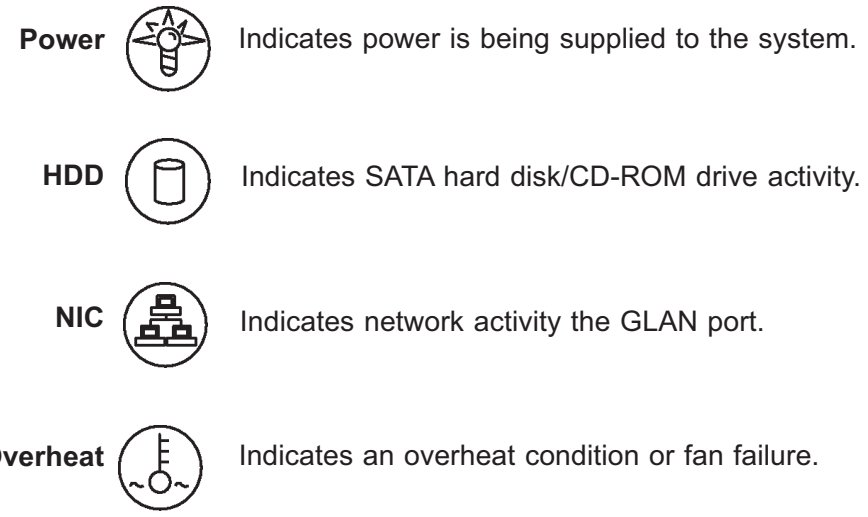


Figure 6-2. Chassis Front View

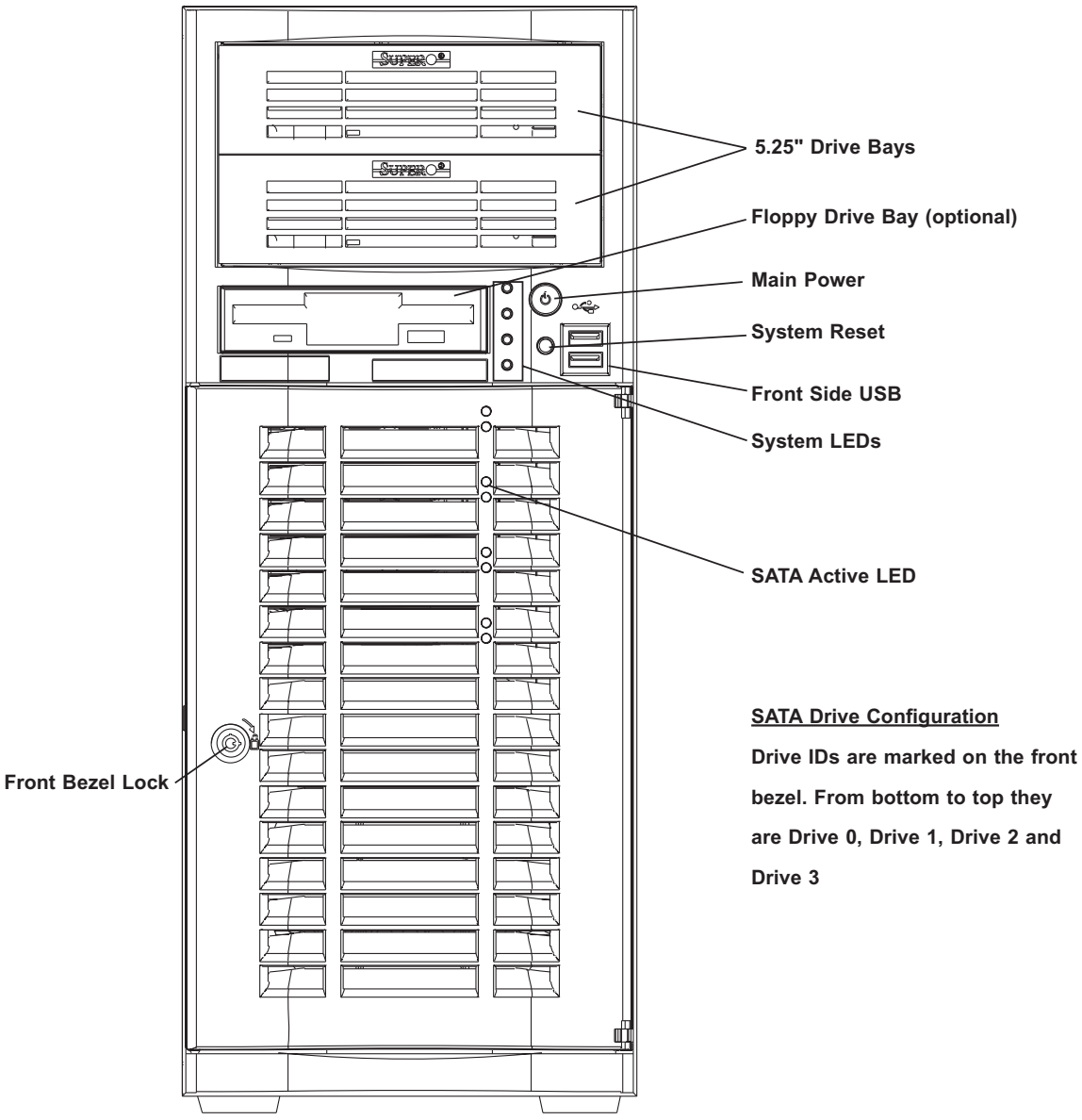
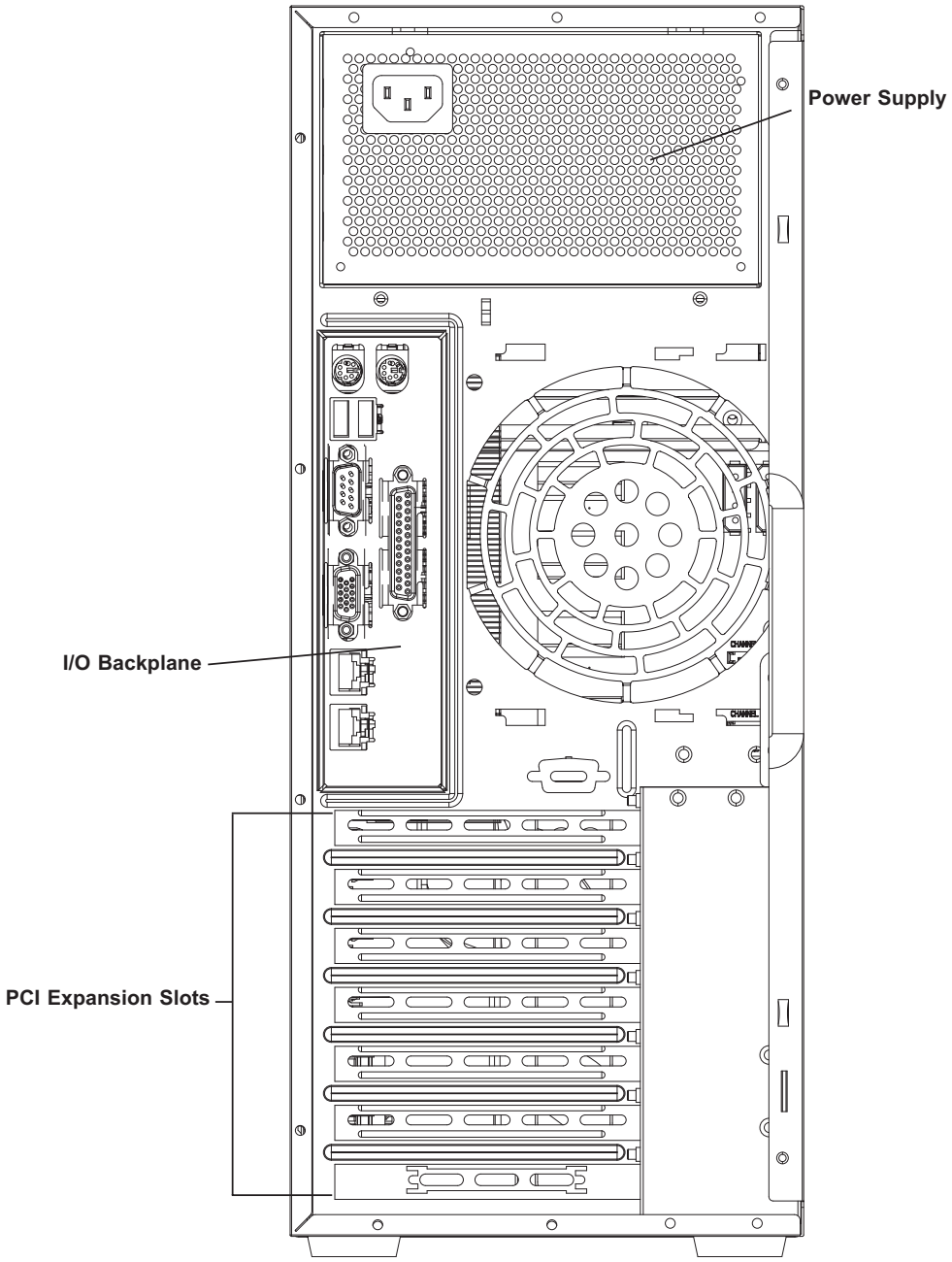


Figure 6-3. Chassis Rear View



6-3 System Fans

A 9-cm chassis cooling fan housed in a fan duct is located just below the peripheral drive bays to provide cool air intake for the system. A 12-cm exhaust fan in the power supply pulls the cool air through the system and expels the hot air.

Fan Failure

Under normal operation, the chassis fan and the power supply fan both run continuously. If the chassis fan fails, the system must be powered down before replacing it. If the power supply fan fails, the power supply itself must be replaced.

Replacing System Fans

Identifying and accessing the fan

1. First, check to see if it is the 9-cm fan at the front of the chassis that has failed. If the 12-cm fan failed, the power supply will need replaced (see section 6-5).

2. Power down the system and remove the left chassis cover by first removing the two screws from the back lip of the cover.

3. Push in the release tab on the cover and push the cover toward the rear of the chassis until it stops (after moving about ½ inch). Then lift the cover out and away from the chassis. (See Figure 2-1 for accessing the inside of the chassis.)

Removing the fan duct assembly

1. After removing the side chassis cover, release the clips that secure the fan duct to the chassis. You can then pull the fan duct out from its location in the chassis.

2. Remove the four screws at the front of the fan duct that hold the fan in place. Then release the two fasteners along the side of the fan duct.

3. You can now separate it into two pieces and easily remove the fan (see Figure 6-4). Add a new fan of the same type (see step 3).

Installing a new fan

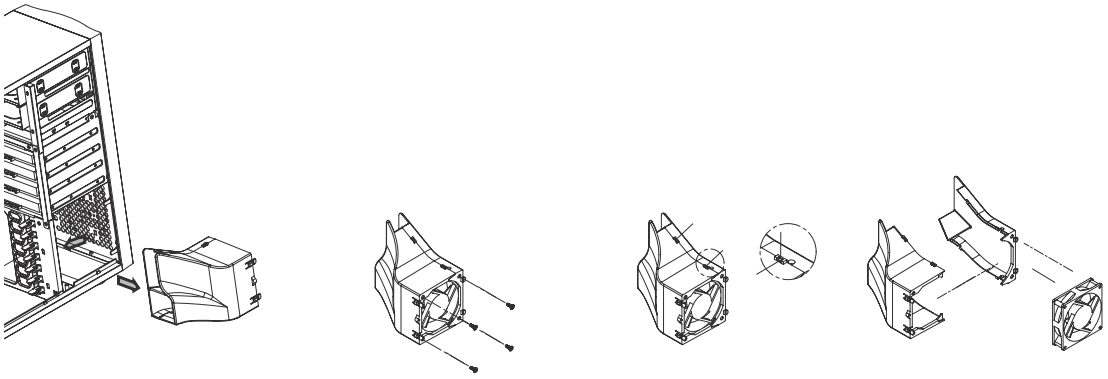
1. Replace the failed fan with an identical one (available from Supermicro).

2. After the new fan has been installed into the fan duct, reassemble the fan duct and perform the removal procedure in reverse to install the entire fan duct assembly back into the chassis. Make sure the wiring for the fan is also reattached to its proper header.

3. Finish by replacing the left chassis cover, then restore power to the system.

4. Check that the replaced fan is working properly.

Figure 6-4. Removing the Fan Duct Assembly



6-4 Drive Bay Installation

A bezel covers the front of the chassis but does not need to be removed to access the drives. If you wish to remove the bezel piece, push on the three tabs on the inside left side lip of the front chassis cover. Then slightly swing out the same (left) side of the cover - about ½ inch only. Remove by pushing on the open side of the cover to remove it from the chassis (do not try to swing or pull it straight out after opening the left side.

Important! Use extreme caution when working around the SATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the airflow holes in the SATA backplane. Regardless of how many SATA hard drives are installed, all four SATA drive carriers must remain in the drive bays to promote proper airflow.

Serial ATA Drives

The SATA drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also work to promote proper airflow for the system. For this reason, even carriers without SATA drives must remain in the workstation.

After unlocking the Serial ATA (SATA) drive bay door, swing it open to access the SATA drive. The drive IDs are preconfigured as 0 through 3 in order from bottom to top. These SATA drives are hot-pluggable, meaning they can be removed and installed without powering down the system.

Installing/removing hot-plug SATA drives

1. To remove a carrier, first open the front bezel then push the release button located beside the drive LEDs.

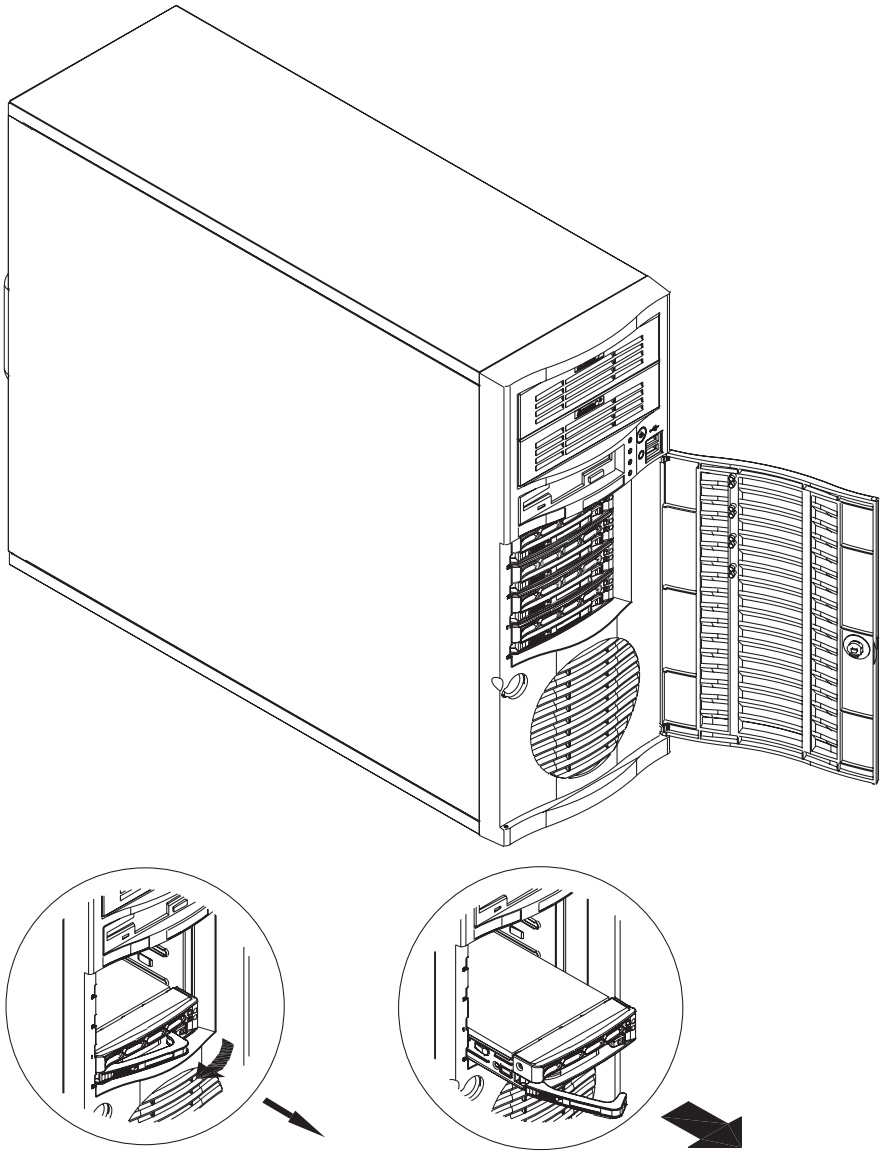
2. Swing the colored handle fully out and use it to pull the unit straight out (see Figure 6-5). **Note:** Your operating system must have RAID support to enable the hot-plug capability of the SATA drives.

Mounting a SATA drive in a drive carrier

1. Insert the drive into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.

2. Secure the drive to the carrier with four screws.

Figure 6-5. Removing a SATA Drive Carrier



Installing Components in the 5.25" Drive Bays

The 5035B-T has two 5.25" drive bays above the SATA drive bays. Components such as a floppy drive, IDE hard drives or CD-ROM drives can be installed in these 5.25" drive bays.

Accessing the drive carrier

1. First power down the system and then remove the top/left chassis cover to access the drive components.

2. With the cover off, remove the two or four screws that secure the drive carrier to the chassis (one side only) then push the entire empty drive carrier out from the back.

Adding a CD-ROM drive

1. Remove the guide plate from right side of the empty drive carrier and screw it into the right side of the CD-ROM drive using the holes provided (see Figure 6-7).

2. Slide the CD-ROM into the bay and secure it to the chassis with the drive carrier screws you first removed.

3. Attach the power and data cables to the drive.

4. Replace the top/left chassis cover before restoring power to the system.

Adding an IDE or floppy drive

1. Install a floppy or IDE drive into one of the removed empty drive carriers with the printed circuit board side toward the carrier so that the drive's mounting holes align with those in the carrier.

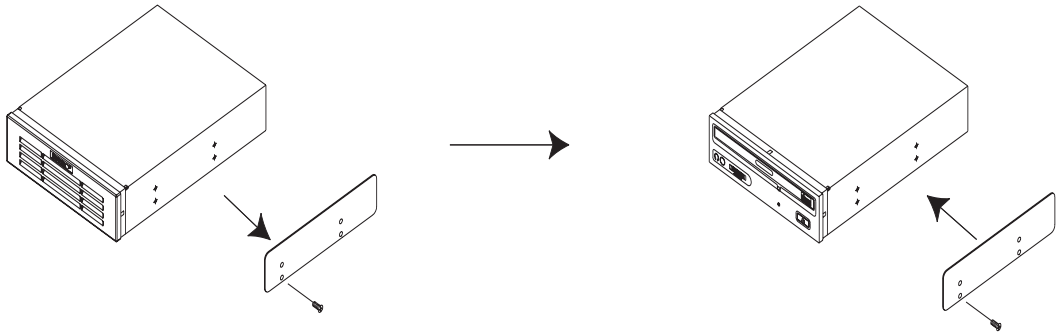
2. Secure the drive to the carrier with four screws then slide the assembly into the bay and secure it to the chassis with the drive carrier screws you first removed.

3. Attach the power and data cables to the drive.

4. Replace the top/left chassis cover before restoring power to the system.

Note: A red wire typically designates the location of pin 1. You should keep the drive carriers inserted in any unused drive bays to reduce EMI and noise and to facilitate the airflow inside the chassis.

Figure 6-7. Adding a Component Without a Drive Carrier



6-5 Power Supply

The 5035B-T has a single 465W high-efficiency power supply that features noise-suppression technology for silent operation. The power supply has the capability to automatically sense and operate with an input voltage of 100 or 240V AC. This power supply also has a PFC (Power Factor Correction) feature built in.

Replacing the Power Supply

1. To replace the power supply, begin by powering down the system
2. Remove the left chassis cover to access the power supply for removal.
3. Unplug the power cord from the power supply. Then remove the power supply connectors going to the motherboard and the SATA backplane.
4. Remove the screws that secure the unit to the mounting brackets in the chassis and then pull the unit completely out.
5. Replace the failed power supply with another having the exact same part number (PWS-465-PQ). Gently but firmly push the new unit all the way into the open bay.
6. Secure it to the mounting brackets in the chassis with the screws provided.
7. Connect two power cables to the SATA backplane and two to the motherboard (ATX PWR CONN and J21 connectors).
8. Finish by replacing the chassis left cover and then restoring power to the system.

Chapter 7

BIOS

7-1 Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the C2SBX. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site <http://www.supermicro.com> for any changes to the BIOS that may not be reflected in this manual.

System BIOS

BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The Phoenix BIOS stores the system parameters, types of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a backup battery provides power to the CMOS logic, enabling it to retain system parameters. Each time the computer is powered on the computer is configured with the values stored in the CMOS logic by the system BIOS, which gains control at boot up.

How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key at the appropriate time during system boot. (See below.)

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus. Beginning with Section 4-3, detailed descriptions are given for each parameter setting in the Setup utility.

Warning: Do not shut down or reset the system while updating BIOS to prevent possible boot failure.

Note: The SPI BIOS chip used in the C2SBX is not removable. To replace a damaged SPI BIOS chip, please send the motherboard to Supermicro for repair.

7-2 Running Setup

Default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see the next page).

When you first power on the computer, the Phoenix BIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Delete> immediately after turning the system on, or

2. When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

Press the <Delete> key to enter Setup

7-3 Main BIOS Setup

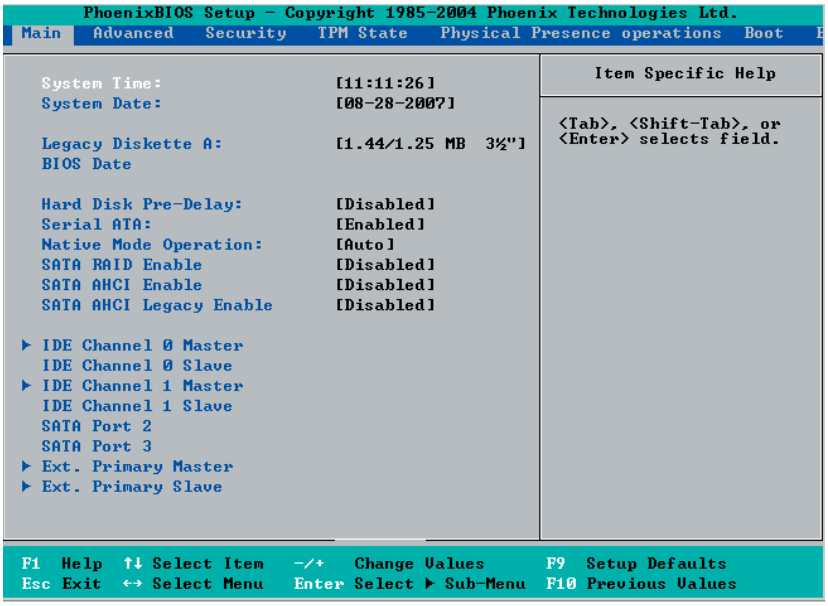
All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ▶icon. With the item highlighted, press the <Enter> key to access the submenu.

Main BIOS Setup Menu



Main Setup Features

System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day and year fields, and enter the correct data. Press the <Enter> key to save the data.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

BIOS Date

The item displays the date that the BIOS was built.

Hard Disk Pre-Delay

When Enabled, this feature will add a delay to provide time need for HDD self-initialization before the HDD is accessed by the BIOS for the first time. Some HDDs will hang if accessed by the BIOS without proper initialization. The options are Enabled and **Disabled.**

Serial ATA

This setting allows the user to enable or disable the function of Serial ATA. The options are Disabled and **Enabled.**

Native Mode Operation

Select Serial ATA to use the SATA mode, or select Auto to use the Native Mode for ATA. The options are: Serial ATA and **Auto**.

Serial ATA (SATA) RAID Enable

Select Enable to enable Serial ATA RAID Functions. (For the Windows OS environment, use the RAID driver if this feature is set to Enabled. When this item is set to Enabled, the item: ICH RAID Code Base will be available for you to select either Intel or Adaptec Host RAID firmware to be activated. If this item is set to **Disabled**, the item-SATA AHCI Enable will be available.) The options are Enabled and **Disabled**.

ICH RAID Code Base

Select Intel to enable the Intel SATA RAID firmware. Select Adaptec to use the Adaptec HostRAID firmware. The options are **Intel** and Adaptec**.**

SATA AHCI

Select Enable to enable the function of Serial ATA Advanced Host Interface. (Take caution when using this function. This feature is for advanced programmers only. The Enhanced AHCI mode is available when the Windows XP-SP1 OS and the IAA Driver is used.) The options are Enabled and **Disabled**.

SATA AHCI Legacy

Select Enable to use Legacy Mode for SATA Advanced Host Interfacing. When this feature is set to Enabled, SATA Port 5 and SATA Port 6 are disabled. (Take caution when using this function. This feature is for advanced programmers only.) The options are Enabled and **Disabled**.

▶IDE Primary Master/Slave, IDE Secondary Master/Slave, SATA Port3 and SATA Port4, Extended Primary Master/Slave

These settings allow the user to set the parameters of IDE Primary Master/Slave, IDE Secondary Master/Slave, SATA Port3/SATA Port4 and Extended Primary Master/Slave slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:

Type

This option allows the user to select the type of IDE hard drive. Select **Auto** to allow the BIOS to automatically configure the parameters of the HDD installed on a slot. Enter a number between 1 to 39 to select a predetermined HDD type. Select User to allow the user to enter the parameters of the HDD installed. Select CDROM if a CDROM drive is installed. Select ATAPI if a removable disk drive is installed.

CHS Format

The following items will be displayed by the BIOS:

TYPE: This item displays the type of IDE or SATA drive.

Cylinders: This item indicates the number of cylinders detected by the BIOS.

Headers: This item indicates the number of headers.

Sectors: This item displays the number of sectors.

Maximum Capacity: This item displays the maximum storage capacity of the system.

LBA Format

The following items will be displayed by the BIOS:

Total Sectors: This item displays the number of total sectors available in the LBA Format.

Maximum Capacity: This item displays the maximum capacity in the LBA Format.

Multi-Sector Transfers

This item allows the user to specify the number of sectors per block to be used in multi-sector transfer. The options are **Disabled**, 4 Sectors, 8 Sectors, and 16 Sectors.

LBA Mode Control

This item determines whether the Phoenix BIOS will access the IDE Primary Master Device via the LBA mode. The options are Enabled and **Disabled.**

32 Bit I/O

This option allows the user to enable or disable the function of 32-bit data transfer. The options are Enabled and **Disabled**.

Transfer Mode

This option allows the user to set the transfer mode. The options are **Standard**, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and FPIO4/DMA2.

Ultra DMA Mode

This option allows the user to configure the Ultra DMA Mode setting. The options are **Disabled**, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, and Mode 5.

System Memory

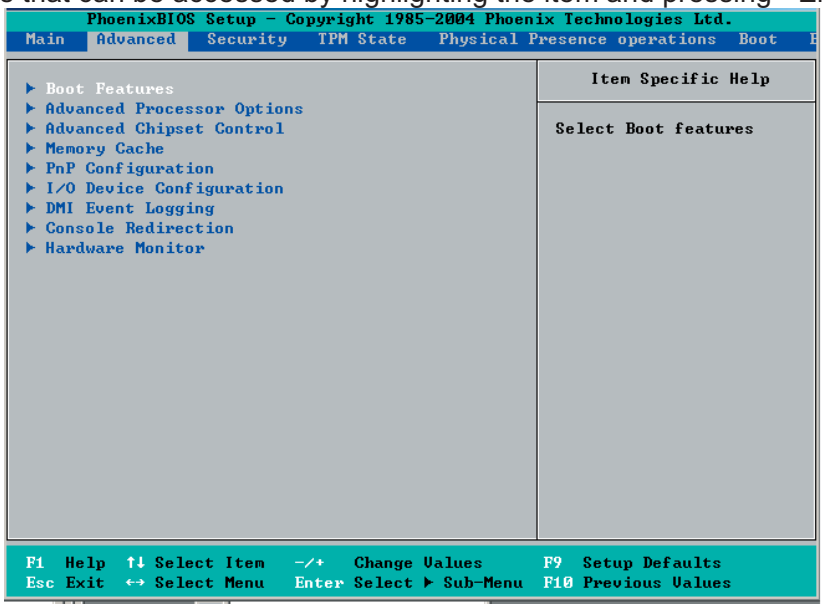
This display informs you how much system memory is detected in the system.

Extended Memory

This display informs you how much extended memory is detected in the system.

7-4 Advanced Setup

Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>.



▶Boot Features

Access the submenu to make changes to the following settings.

Quiet Mode

This setting allows you to **Enable** or Disable the graphic logo screen during boot-up.

QuickBoot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine by skipping certain tests after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

ACPI Mode

Select Yes to **use** the ACPI (Advanced Configuration and Power Interface) power management feature on your system. The options are **Yes** and No.

ACPI Sleep Mode

This feature allows you to decide which ACPI (Advanced Configuration and Power Interface) power management mode to use when in the sleep mode. The options are **S1,** S3 and S1S3.

Power Button Behavior

If set to **Instant-Off**, the system will power on or power off immediately as soon as the user hits the power button. The options are **Instant-Off** and 4-Second Override.

Resume On Modem Ring

Select On to “wake your system up” when an incoming call is received by your modem. The options are On and **Off**.

Resume On PME#

Select On to “wake your system up” from the PME# of PCI slots. The options are On and **Off**.

PS2 Keyboard (KB)/Mouse Wake Up

Select Enable to “wake your system up” from the S3, S4 or S5 state. If this feature is set to Enabled, you will also need to enable the JPWAKE jumper by closing pins 1-2. (Please refer to Pg. 1-5 and Chapter 2 for more details). The default setting is **Disabled**.

Power Loss Control

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are Stay Off, Power On, and **Last State**.

Watch Dog

If enabled, this option will automatically reset the system if the system is not active for more than 5 minutes. The options are Enabled and **Disabled**.

Summary Screen

This setting allows you to **Enable** or Disable the summary screen which displays the system configuration during bootup.

▶Advanced Processor Options

Access the submenu to make changes to the following settings.

CPU Speed

This is a display that indicates the speed of the installed processor.

Frequency Ratio (Available when supported by the CPU.)

The feature allows the user to set the internal frequency multiplier for the CPU. The default setting is **Default**.

Frequency High Ratio (Available when supported by the CPU.)

The feature allows the user to set high ratio internal frequency multiplier for Intel SpeedStep CPUs. The default setting is **x12**.

Note: If a wrong ratio that is not supported by the CPU is selected, the system may hang. If this happens, clear CMOS to recover the system.)

Hyper-threading (Available when supported by the CPU.)

Set to Enabled to use the Hyper-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Core-Multi-Processing (Available when supported by the CPU.)

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are Disabled and **Enabled.**

Single Logical Processing

Set to Enabled if you want to use a single-core processor. The options are Enabled and **Disabled.**

Machine Checking (Available when supported by the CPU.)

Set to Enabled to activate the function of Machine Checking and allow the CPU to detect and report hardware (machine) errors via a set of model-specific registers (MSRs). The options are **Disabled** and Enabled.

Compatible FPU Code (Available when supported by the CPU.)

Set to Enabled to keep the content of the last instruction Operating Code (OP Code) in the floating point (FP) state. The options are **Disabled** and Enabled.

L3 Cache (Available when supported by the CPU.)

Set to Enabled to enable the function of L3 Cache to optimize system and CPU performance. The options are Disabled and **Enabled**.

Thermal Management 2 (Available when supported by the CPU.)

Set to **Enabled** to use Thermal Management 2 (TM2) which will lower CPU voltage and frequency when the CPU temperature reaches a predefined overheat threshold.

Set to Disabled to use Thermal Manager 1 (TM1), allowing CPU clocking to be regulated via CPU Internal Clock modulation when the CPU temperature reaches the overheat threshold.

Adjacent Cache Line Prefetch (Available when supported by the CPU.)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if Enabled. The options are Disabled and **Enabled**.

Set Maximum Ext. CPUID=3

When set to Enabled, the Maximum Extended CPUID will be set to 3. The options are **Disabled** and Enabled.

Echo TPR

Set to **Enabled** to prevent xTPR messages from being sent to the system.The options are Disabled and **Enabled**.

C1 Enhanced Mode (Available when supported by the CPU.)

Set to **Enabled** to enable Enhanced Halt State to lower CPU voltage/frequency to prevent overheat. The options are E**nabled** and Disabled. **Note:** please refer to Intel's web site for detailed information.

Intel <R> Virtualization Technology (Available when supported by the CPU.)

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are Enabled and **Disabled**. **Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

No Execute Mode Memory Protection (Available when supported by the CPU and the OS.)

Set to Enabled to enable Execute Disable Bit and allow the processor to classify areas in memory where an application code can execute and where it cannot, and thus preventing a worm or a virus from inserting and creating a flood of codes to overwhelm the processor or damage the system during an attack.

Note: this feature is available when your OS and your CPU support the function of Execute Disable Bit. The options are Disabled and **Enabled**. **Note**: For more information regarding hardware/software support for this function, please refer to Intel's and Microsoft's web sites.

Enhanced Intel Speed Step Support (Available when supported by the

CPU.)

Select Enabled to use the Enhanced Intel SpeedStep Technology and allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. The default setting is **GV1/GV3**. Please refer to Intel's web site for detailed information.

▶Advanced Chipset Control

Access the submenu to make changes to the following settings.

Warning: Take Caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency, or an incorrect DRAM timing may cause the system to become unstable. When this occurs, reset the setting to the default setting.

Memory Reclaiming

Select Enable to enable the functionality of Memory Remapping above 4GB. The settings are **Enabled** and Disabled.

Default Primary Video Adapter

This feature allows the user to select the video device used by the BIOS during POST. If set to **Auto**, PEG and PCI devices will be selected. If set to PEG, PEG devices will be selected. If set to PCI, PCI devices will be selected.

Azalia Audio

Select **Auto** to enable Azalia Audio. The settings are **Auto** and Disabled.

High Precision Event Time

Select Yes to activate the High Precision Event Timer (HPET), which is capable of producing periodic interrupts at a much higher frequency than a Real-time Clock (RTC) can in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in a CPU. The High Precision Event Timer is used to replace the 8254 Programmable Interval Timer. The options for this feature are Yes and **No**.

Route Port 80h Cycles to

This feature allows the user to decide which bus to send debug information to. The options are Disabled, **PCI** and LPC.

Legacy USB Support

This setting allows you to enable support for Legacy USB devices. The settings are **Enabled** and Disabled.

USB Host Controller 1

This feature allows the user to configure the USB Host Controller setting for USB Device #29 Functions 0, 1, 2, 3, 7. The default setting is **Enabled.** (Fun0: USB 1/2 Control, Fun1: USB 3/4 Control, Fun2: USB 5/6 Control, Fun3: USB 11/12 Control, Fun7: USB 1-6 USB 2.0 Control)

USB Host Controller 2

This feature allows the user to configure the USB Host Controller setting for USB Device #26 Functions 0, 1, 2, 7. The default setting is **Enabled.** (Fun0: USB 7/8 Control, Fun1: USB 9/10 Control, Fun2: USB 11/12 Control, Fun7: USB 7-12 USB 2.0 Control)

▶Memory Cache

Cache System BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow the BIOS to write (cache) data into this reserved memory area. Select **Write Protect** to enable this function, and this area will be reserved for BIOS ROM access only. Select Uncached to disable this function and make this area available for other devices.

Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS to write (cache) data into this reserved memory area. Select **Write Protect** to enable the function and this area will be reserved for Video BIOS ROM access only. Select Uncached to disable this function and make this area available for other devices.

Cache Base 0-512K

If enabled, this feature will allow the data stored in the base memory area: block 0-512K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or to be written into the L1, L2 cache inside the CPU to speed up CPU operations . Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 0-512K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Base 512K-640K

If enabled, this feature will allow the data stored in the memory area: 512K-640K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or written into the L1, L2, L3 cache inside the CPU to speed up CPU operations.

Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 512K-640K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Extended Memory

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or written into the L1, L2, L3 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the extended memory area above 1 MB. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

▶PnP Configuration

Access the submenu to make changes to the following settings for PCI devices.

PCI-X(s) Frequency

When set to **Enabled,** this feature allows the user to set the bus frequency for a PCI-X slot for it to work properly. The options are **Auto,** PCI 33MHz, PCI 66MHz, PCI-X 66MHz, PCI-X 100MHz and PCI-X 133MHz.

▶PCI-X Slot#1- PCI-X Slot#2

Access the submenu to change to the following items:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are **Enabled** and Disabled.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h.

For Unix, Novelle and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate.

▶PCI 32 Slot#3- PCI 32 Slot#5

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are **Enabled** and Disabled.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novelle and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate.

▶PCI-E x1

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are **Enabled** and Disabled.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novelle and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate.

▶Onboard LAN

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are **Enabled** and Disabled.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novelle and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate**.**

▶I/O Device Configuration

Access the submenu to make changes to the following settings.

KBC Clock Input

This setting allows you to select clock frequency for the keyboard clock. The options are 6MHz, 8MHz, **12MHz,** and 16MHz.

Serial Port A

This setting allows you to assign control of Serial Port A. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- or OS- controlled).

Base I/O Address

This setting allows you to select the base I/O address for Serial Port A. The options are **3F8**, 2F8, 3E8, and 2E8.

Interrupt

This setting allows you to select the IRQ (interrupt request) for Serial Port A. The options are IRQ3 and **IRQ4**.

Serial Port B

This setting allows you to assign control of Serial Port B. The options are **Enabled** (user defined), Disabled, Auto (BIOS- controlled) and OS- Controlled.

Mode

This setting allows you to set the type of device that will be connected to Serial Port B. The options are **Normal** and IR (for an infrared device).

Base I/O Address

This setting allows you to select the base I/O address for Serial Port B. The options are 3F8, **2F8**, 3E8 and 2E8.

Interrupt

This setting allows you to select the IRQ (interrupt request) for Serial Port B. The options are **IRQ3** and IRQ4.

Parallel Port

This setting allows you to assign control of the parallel port. The options are **Enabled** (user defined), Disabled and Auto (BIOS- or OS- controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **378**, 278 and 3BC.

Interrupt

This setting allows you to select the IRQ (interrupt request) for the parallel port. The options are IRQ5 and **IRQ7**.

Mode

This feature allows you to specify the parallel port mode. The options are Output only, Bi-Directional, EPP and **ECP**.

DMA Channel

This item allows you to specify the DMA channel for the parallel port. The options are DMA1 and **DMA3**.

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- and OS- controlled).

▶DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

This is a display to inform you of the event log validity. It is not a setting.

Event Log Capacity

This is a display to inform you of the event log capacity. It is not a setting.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Event Logging

This setting allows you to **Enable** or Disable event logging.

ECC Event Logging

This setting allows you to **Enable** or Disable ECC event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs. The options are Yes and **No**.

▶Console Redirection

Access the submenu to make changes to the following settings.

COM Port Address

This item allows you to specify which COM port to direct the remote console to: Onboard COM A or Onboard COM B. This setting can also be **Disabled**.

BAUD Rate

This item allows you to set the BAUD rate for the console redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K, and 115.2K.

Console Type

This item allows you to set the console redirection type. The options are VT100; VT100, 8bit; PC-ANSI, 7bit; **PC ANSI;** VT100+; VT-UTF8 and ASCII.

Flow Control

This item allows you to select the flow control option for the console. The options are: None, XON/XOFF, and **CTS/RTS**.

Console Connection

This item allows you to decide how console redirection is to be connected: either **Direct** or Via Modem.

Continue CR after POST

This feature allows you to decide if you want to continue with console redirection after the POST routine. The options are On and **Off**.

▶Hardware Monitoring

CPU Overheat Temperature

This option allows the user to set a CPU temperature overheat threshold that will activate the alarm system when the CPU temperature reaches this pre-set temperature threshold. The options are 75°C, **80°C**, 85°C, and 90°C

Highlight this and hit <Enter> to see monitor data for the following items:

CPU Temperature

System Temperature

Fan 1 to Fan 5

If the feature of Auto Fan Control is enabled, the BIOS will automatically display the status of each fan as specified.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. If the option is set to 3-pin fan, the fan speed is controlled by voltage. If the option is set to 4-pin, the fan speed will be controlled by Pulse Width Modulation (PWM). Select 3-pin if your chassis came with 3-pin fan headers. Select 4-pin if your chassis came with 4-pin fan headers. Select Workstation if your system is used as a Workstation. Select Server if your system is used as a Server. Select Disable to disable the fan speed control function to allow the onboard fans to constantly run at the full speed (12V). The Options are: **1. Disable**, 2. 3-pin (Server), 3. 3-pin (Workstation), 4. 4-pin (Server) and 5. 4-pin (Workstation).

Voltage Monitoring

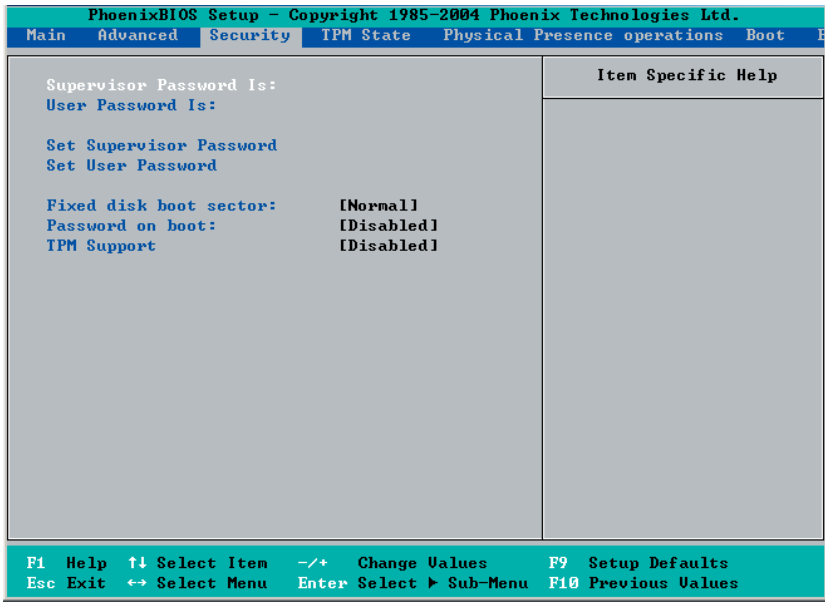
The following items will be monitored and displayed:

Vcore A
VDIMM
-12V/+12V
+5V
+3.3VDD/+3.3Vsb
Vbat

Note: In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

7-5 Security Settings

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.



Supervisor Password Is:

This item indicates if a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password Is:

This item indicates if a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to the BIOS.

Set User Password

When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Fixed Disk Boot Sector

Select **Normal** to enable the feature of Write-Protect to protect the boot sector on the hard drives from virus intrusion.

Password on Boot

When set to Enabled, a user will need to key-in a password to enter the system at system boot. The options are Enabled (password required) and Disabled (password not required).

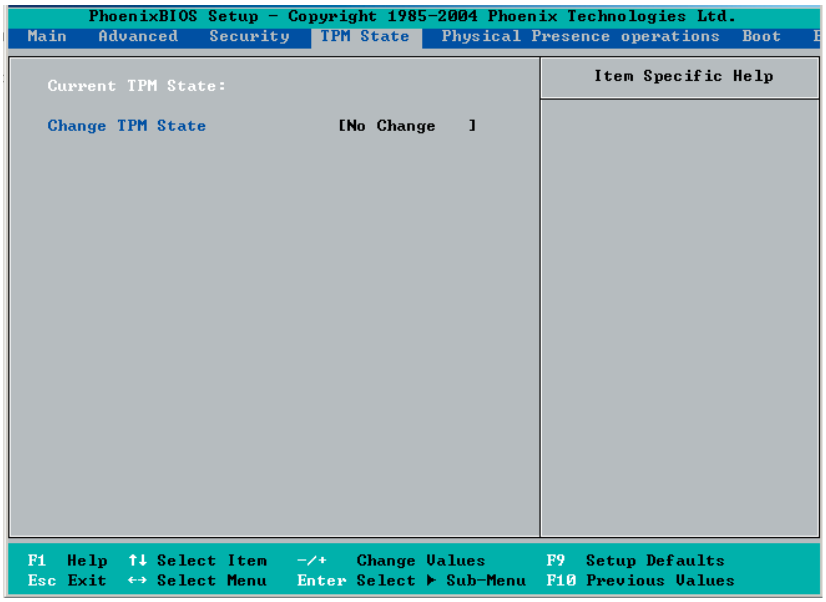
Trusted Platform Support

Select Enabled to enable trusted platforms support and allow the BIOS to automatically download the drivers needed to provide support for the platforms specified. The options are Enabled and **Disabled**.

7-6 TPM (Trusted Platform Modules) State

(Available if TPM Support is enabled in the Security Setting)

Choose the TPM State menu from the Phoenix BIOS Setup Utility with the arrow keys. You should see the following display.



Current TPM State

This item shows the current TPM State only.

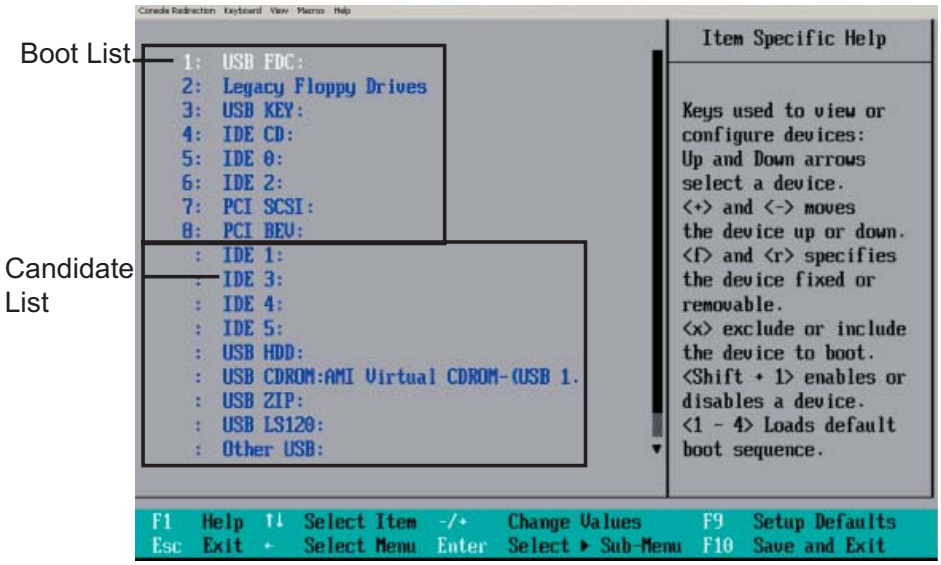
Change TPM State

Select Enabled & Activate to enable TPM support for the system. Select De-activate & Disabled to disable the function of TPM support. If No Change is selected, no changes will be done to the current TPM State. Select Clear to clear or erase all information related to TPM support.

If set to Clear, the sub-menu: Physical Presence Operations will appear. Select Reject to cancel the selection. Select Execute to proceed with selection. All information related to TPM Support will be erased.

7-7 Boot Settings

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. See details on how to change the order and specs of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.

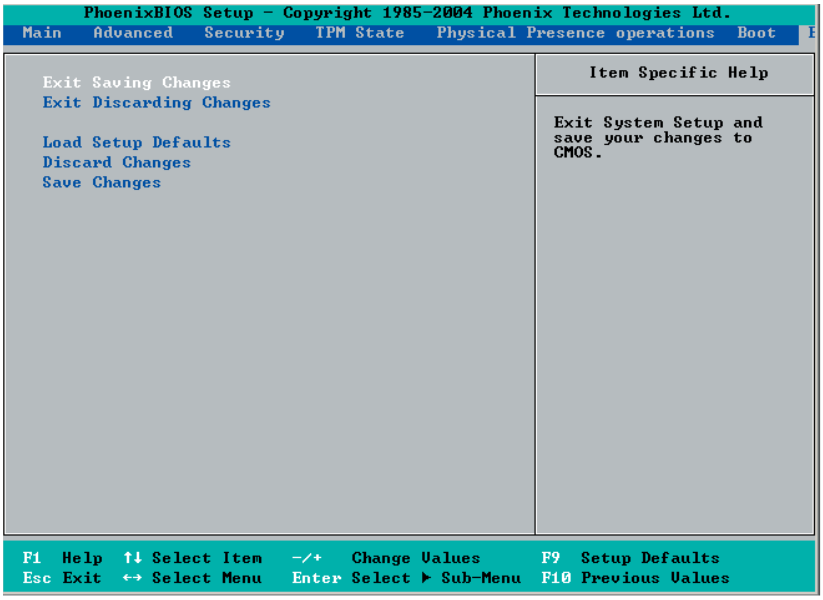


Boot Priority Order/Excluded from Boot Orders

The devices included in the boot list section (above) are bootable devices listed in the sequence of boot order as specified. The boot functions for the devices included in the candidate list (above) are currently disabled. Use a <+> key or a <-> key to move the device up or down. Use the <f> key or the <r> key to specify the type of an USB device, either fixed or removable. You can select one item from the boot list and hit the <x> key to remove it from the list of bootable devices (to make its resource available for other bootable devices). Subsequently, you can select an item from the candidate list and hit the <x> key to remove it from the candidate list and put it in the boot list. This item will then become a bootable device. See details on how to change the priority of boot order of devices in the "Item Specific Help" window.

7-8 Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. All Exit BIOS settings are described in this section.



Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you made and to exit the BIOS Setup utility.

Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you made. You will remain in the Setup utility.

Save Changes

Highlight this item and hit <Enter> to save any changes you made. You will remain in the Setup utility.

Notes

Appendix A

BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.**Failure Fixed Disk**

Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.

Stuck key
Stuck key on keyboard.

Keyboard error
Keyboard not working.

Keyboard Controller Failed
Keyboard controller failed test. May require replacing keyboard controller.

Keyboard locked - Unlock key switch
Unlock the system to proceed.

Monitor type does not match CMOS - Run SETUP
Monitor type not correctly identified in Setup

Shadow Ram Failed at offset: nnnn
Shadow RAM failed at offset **nnnn** of the 64k block at which the error was detected.

System RAM Failed at offset: nnnn
System RAM failed at offset **nnnn** of in the 64k block at which the error was detected.

Extended RAM Failed at offset: nnnn Extended memory not working or not configured properly at offset **nnnn.**

System battery is dead - Replace and run SETUP
The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.

System CMOS checksum bad - Default configuration used
System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.

System timer error
The timer test failed. Requires repair of system board.

Real time clock error
Real-Time Clock fails BIOS hardware test. May require board repair.

Check date and time settings
BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991-2099).

Previous boot incomplete - Default configuration used
Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait states**, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the waitstate configuration is correct. This error is cleared the next time the system is booted.

Memory Size found by POST differed from CMOS
Memory size found by POST differed from CMOS.

Diskette drive A error
Diskette drive B error
Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.

Incorrect Drive A type - run SETUP
Type of floppy drive A: not correctly identified in Setup.

Incorrect Drive B type - run SETUP
Type of floppy drive B: not correctly identified in Setup.

System cache error - Cache disabled
RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache

slows system performance considerably.

CPU ID:
CPU socket number for Multi-Processor error.

EISA CMOS not writeable
ServerBIOS2 test error: Cannot write to EISA CMOS.

DMA Test Failed
ServerBIOS2 test error: Cannot write to extended **DMA** (Direct Memory Access) registers.

Software NMI Failed
ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

Fail-Safe Timer NMI Failed
ServerBIOS2 test error: Fail-Safe Timer takes too long.

Device Address Conflict
Address conflict for specified **device.**

Allocation Error for: device
Run ISA or EISA Configuration Utility to resolve resource conflict for the specified **device**.

CD ROM Drive
CD ROM Drive identified.

Entering SETUP ...
Starting Setup program

Failing Bits: nnnn
The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

Fixed Disk n
Fixed disk **n** (0-3) identified.

Invalid System Configuration Data
Problem with NVRAM (CMOS) data.

I/O device IRQ conflict
I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:
PS/2 Mouse installed.

nnnn kB Extended RAM Passed
Where **nnnn** is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed
Where **nnnn** is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed
Where **nnnn** is the amount of shadow RAM in kilobytes successfully tested.

nnnn kB System RAM Passed
Where **nnnn** is the amount of system RAM in kilobytes successfully tested.

One or more I2O Block Storage Devices were excluded from the Setup Boot Menu
There was not enough room in the IPL table to display all installed I2O block-storage devices.

Operating system not found
Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.

Parity Check 1 nnnn
Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.** Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.

Parity Check 2 nnnn
Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.**

Press <F1> to resume, <F2> to Setup, <F3> for previous
Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an **Option ROM**, i.e., an add-on card). Write down and follow the information shown on the screen.

Press <F2> to enter Setup
Optional message displayed during POST. Can be turned off in Setup.

PS/2 Mouse:
PS/2 mouse identified.

Run the I2O Configuration Utility
One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

System BIOS shadowed
System BIOS copied to shadow RAM.

UMB upper limit segment address: *nnnn*
Displays the address ***nnnn*** of the upper limit of **Upper Memory Blocks**, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

Video BIOS shadowed
Video BIOS successfully copied to shadow RAM.

Notes

Appendix B

BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the Phoenix BIOS. POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display an POST code that describes the problem. BIOS may also issue one of the following beep codes:

1 long and two short beeps - video configuration error
1 repetitive long beep - no memory detected

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen. The following is a list of codes that may be written to port 80h.

POST Code	Description
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Reset PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size

POST Code	Description
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line ***xxxx****
2Eh	1-3-4-3 RAM failure on data bits ***xxxx**** of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot (optional)
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board (optional)
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt “Press <ESC> to enter SETUP”
5Bh	Disable CPU cache

POST Code	Description
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring (optional)
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs (optional)
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table
98h	1-2 Search for option ROMs and shadow if successful. One long, two short beeps on checksum failure
99h	Check for SMART Drive (optional)

POST Code	Description
99h	Check for SMART Drive (optional)
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase <ESC> prompt
AAh	Scan for <ESC> key stroke
ACh	Enter SETUP
AEh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST (optional)
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS and PPM Structures
B9h	Prepare Boot
BAh	Initialize SMBIOS
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error flags
C6h	Console redirection init.
C7h	Unhook INT 10h if console redirection enabled
C8h	Force check (optional)
C9h	Extended ROM checksum (optional)
CDh	Reclaim console redirection vector
D2h	Unknown interrupt
D4h	Check Intel Branding string
D8h	Alert Standard Format initialization
DEh	Log error if micro-code not updated properly

The following are for the boot block in the Flash ROM

POST Code	Description
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

If the BIOS detects errors on 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (***xxxx***) indicating the address line or bits that have failed. For example, “2C 0002” means address line 1 (bit one set) has failed. “2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the check-point code, followed by a delay, the high-order byte, another delay, and then the low-order byte of the error. It repeats this sequence continuously.

Notes

Appendix C

HostRAID Setup

After all the hardware has been installed, you must first configure SATA HostRAID or SAS HostRAID before you install the Windows Operating System and other software drivers.

Important Notes to the User

1. This chapter describes RAID Configuration Instructions for the Intel ICH9R Host RAID Controller designed for the Windows OS.

2. If you do not wish to configure onboard SATA or SAS RAID functions, please go directly to Section C-2 and Appendix D for the operating system & other software installation instructions.

C-1 Introduction to Serial ATA and Parallel ATA

To configure the SATA RAID functions, you must first use the Intel ICH9R SATA RAID Utility program to configure the RAID Level that you desire before installing the Windows XP/2000/2003 operating system and other software drivers. (The necessary drivers are all included on the Supermicro CD that came packaged with your motherboard.) Note: the current version of the ICH9R SATA RAID Utility can only support Windows XP/2000/2003 Operating Systems.

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface that uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link, which supports transfer rates up to 3.0 Gbps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems have better airflow and can be installed in smaller chassis. In addition, the cables used in PATA are limited to a length of 40cm, while Serial ATA cables can be up to one meter in length. Overall, SATA provides better functionality than PATA.

Introduction to the Intel ICH9R Serial RAID

Located in the South Bridge of the X38 chipset, the I/O Controller Hub (ICH9R) provides the I/O subsystem with access to the rest of the system. It supports 1-channel UltraATA/100 Bus Master IDE controller (PATA) and six Serial ATA (SATA) ports. The ICH9R supports the following PATA and SATA device configurations: Legacy mode and Native mode.

Intel HostRAID Configurations

The following types of Intel's HostRAID configurations are supported:

RAID 0 (Data Striping): this writes data in parallel, interleaved ("striped") sections of two hard drives. Data transfer rate is doubled over using a single disk.

RAID1 (Data Mirroring): an identical data image from one drive is copied to another drive. The second drive must be the same size or larger than the first drive.

RAID 10 (Striping & Mirroring): RAID 0 and 1 schemes are combined (without parity information) to get the benefits of both.

RAID 5: both data and parity information are striped and mirrored across three or more hard drives.

Intel Matrix Storage

The Intel Matrix Storage, supported by the ICH9R, allows the user to create RAID 0, RAID 1, RAID 10 and RAID 5 sets by using only six identical hard disk drives. The Intel Matrix Storage Technology creates two partitions on each hard disk drive and generate a virtual RAID 0, RAID 1, RAID 10 and RAID 5 sets. It also allows you the change the HDD partition size without any data.

Configuring BIOS settings for SATA RAID Functions (in Native Mode)

1. Press the <Del> key during system bootup to enter the BIOS Setup Utility. **Note**: For the first time powering on the system, we recommend you load the optimized default settings. If you have already done so, please skip to Step 3.

2. Use the arrow keys to select the "Exit" Settings. Once in the "Exit" settings, Scroll down to select "Load Optimized Default Settings" and press the <Enter> key. Select "OK" to confirm the selection. Press the <Enter> key to load the default settings for the BIOS.

3. Use the arrow keys to select the "Main" section in BIOS.

4. Scroll down to "SATA RAID Enabled" and press <Enter>. Then select "Enabled."

5. Scroll down to "Exit". Select "Save and Exit" from the "Exit" menu. Press the <Enter> key to save the changes and exit the BIOS.

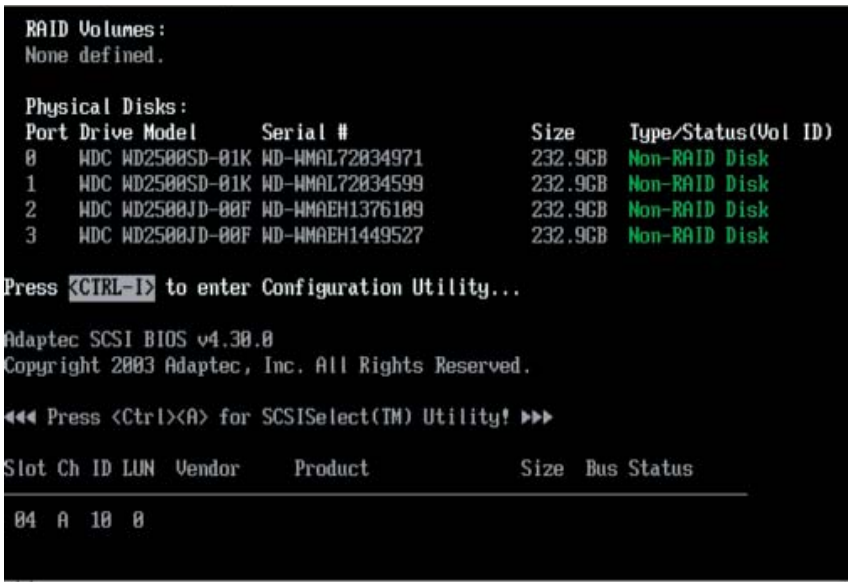
6. Once you've exited the BIOS Utility, the system will reboot.

7. During the system boot-up, press the <Ctrl> and <I> keys simultaneously to run the Intel RAID Configuration Utility when prompted. **Note:** The Intel RAID Configuration Utility is only available for systems with two or more drives installed; the utility screen will not display in systems with one drive installed.

Using the Intel ESB2 SATA RAID Utility Program

1. Creating, Deleting and Resetting RAID Volumes:

a. After the system exits from the BIOS Setup Utility, the system will automatically reboot. The following screen appears after Power-On Self Test.



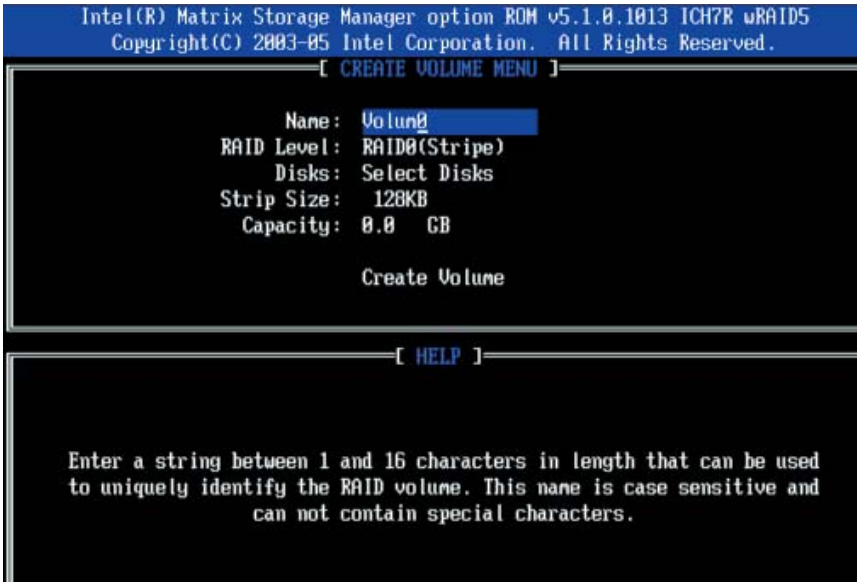
b. When you see the above screen, press the <Ctrl> and the <I> keys simultaneously to access the main menu of the SATA RAID Utility.

c. Use the Up and Down arrow keys to select Create RAID Volume, Delete RAID Volume, Reset Disks to Non-RAID or Exit.

N**ote**: All graphics and screen shots shown in the manual are for reference only. The screen shots shown in the manual do not imply Supermicro's endorsement or non-endorsement on any 3rd party's product. Your screens may or many not look exactly the same as the graphics shown in this manual.

Creating a RAID 0 Volume:

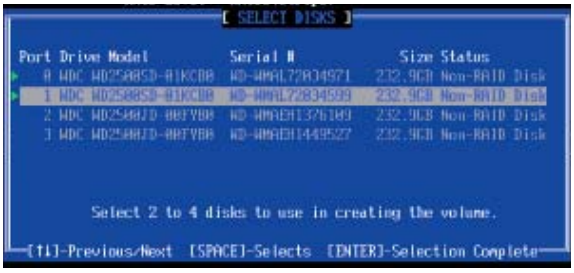
a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:



b. Specify a name for the RAID 0 set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)

c. When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select RAID 0 (Stripe) and hit <Enter>.

d. When the Select Disks item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen displays: (*See the note on Page C-3)



e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive. When all RAID drives for this volume have been selected, hit <Enter>.

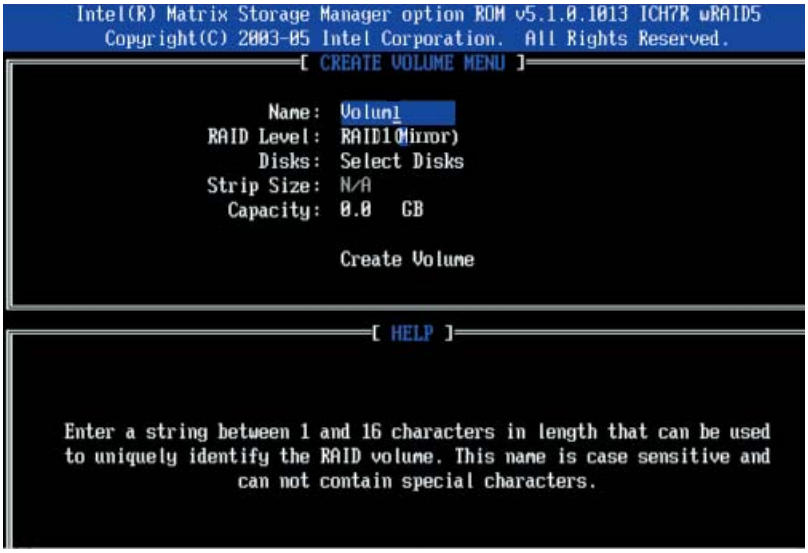
f. Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranging from 4 KB to 128 KB for the RAID 0 array, and hit <Enter>. (**Note**: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.)

g. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

h. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 1 Volume:

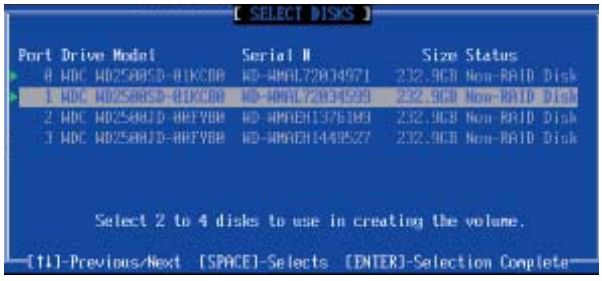
a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:



b. Specify a name for the RAID 1 set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)

c. When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select RAID 1 (Mirror) and hit <Enter>.

d. When Select Disks Item is height lighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen displays: (*See the note on Page C-3)



e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive. When all RAID drives for this volume have been selected, hit <Enter>.

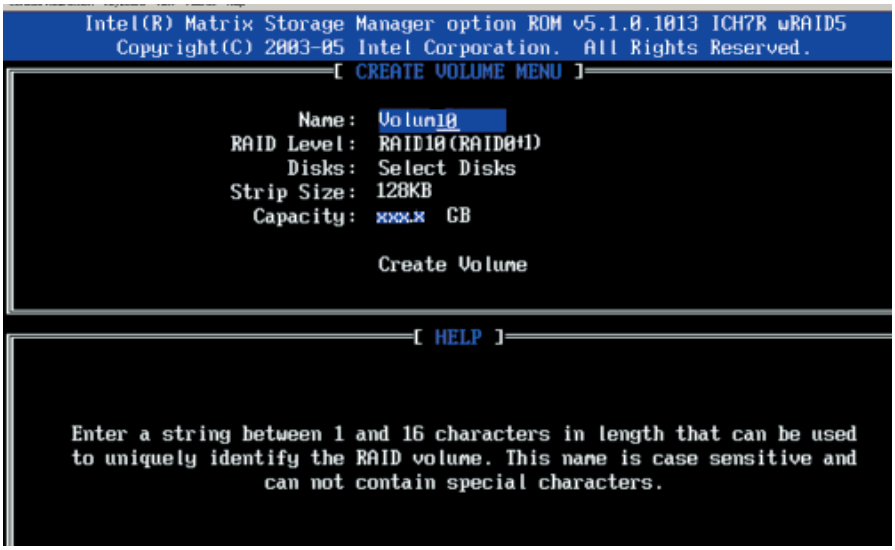
f. When the Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.

g. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

h. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 10 (RAID 1+ RAID 0):

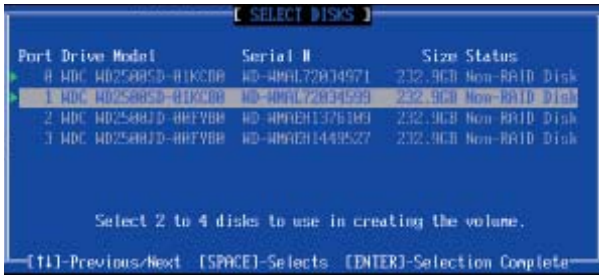
a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:



b. Specify a name for the RAID 10 set and press <Enter>.

c. When RAID Level item is highlighted, use the <Up Arrow>, <Down Arrow> keys to select RAID 10 (RAID1 + RAID0) and hit <Enter>.

d. When Select Disks Item is height lighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen displays: (*See the note on Page C-3)



e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive. When all RAID drives for this volume have been selected, hit <Enter>.

f. When the Stripe Size is highlighted, use the <Up Arrow>, <Down Arrow> keys to select the stripe size from 4 KB to 128 KB for your RAID 10 and hit <Enter>. The default setting is 64 KB. (N**ote**: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size.)

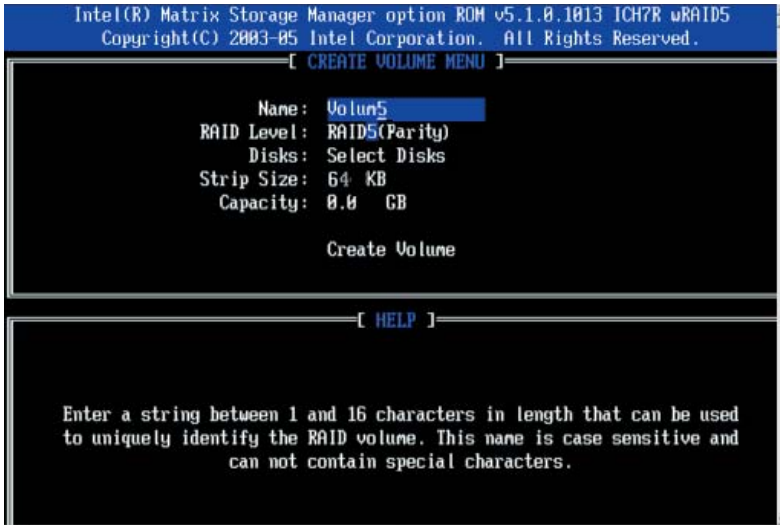
g. When the RAID Volume Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.

h. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

i. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 5 Set (Parity):

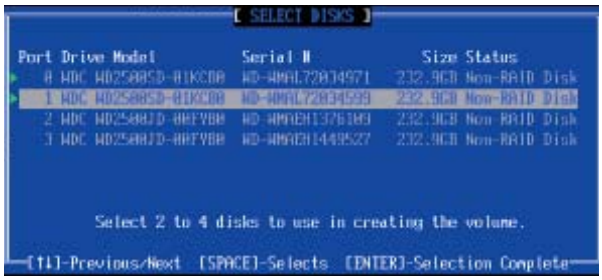
a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:



b. Specify a name for the RAID 5 set and press <Enter>.

c. When the Raid Level is highlighted, use the <Up Arrow>, <Down Arrow> keys to select RAID 5 (Parity) and hit <Enter>.

d. When the Disk item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen displays: (*See the note on Page C-3)



e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive. When all RAID drives for this volume have been selected, hit <Enter>.

f. Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranging from 4 KB to 128 KB for the RAID 5 array, and hit <Enter>. (**Note**: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.)

g. Enter your desired RAID volume capacity and press <Enter> when the capacity item is highlighted. The default setting is the maximum capacity allowed.

h Press <Enter> when "Create Volume" is highlighted. A warning message displays.

i. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Deleting a RAID Volume:

Warning: Be sure to back up your data before deleting a RAID set. You will lose all data on the disk drives when deleting a RAID set.)

a. From the main menu, select item2-Delete RAID Volume, and press <Enter>.

b. Use the <Up Arrow>, <Down Arrow> keys to select the RAID set you want to delete and press <Del>. A Warning message displays.

c. When asked "Are you sure you want to delete this volume (Y/N), press "Y" to delete the RAID volume, or type "N" to go back to the Delete Volume menu.

Resetting to Non-RAID and Resetting a RAID HDD

Warning: Be cautious when you reset a RAID volume HDD to non-RAID or Resetting a RAID HDD. Resetting a RAID volume HDD or Resetting a RAID HDD will reformat the HDD and delete the internal RAID structure on the drive.

a. From the main menu, select item3-Reset Disks to Non- RAID, and press <Enter>. The following screen will appear:

b. Use the <Up Arrow>, <Down Arrow> keys to highlight the RAID set drive to reset and press <Space> to select. (*For this feature to work properly, you must select all drives within a RAID volume.)

c. Press <Enter> to reset the RAID set drive. A Warning message displays.

d. Press "Y" to reset the drive, or type "N" to go back to the main menu.

Exiting the Intel Matrix Storage Manager Utility:

a. From the main menu, select item4-Exit, and press <Enter>. A warning message will appear.

b. Press "Y" to reset the drive, or type "N" to go back to the main menu.

C-2 Installing Windows XP/2000/2003 for RAID Systems

Installing a New Operating System-the Windows XP/2000/2003 OS

1. Insert the Microsoft Windows XP/2000/2003 Setup CD in the CD Driver, and the system will start booting up from CD.

2. Press the <F6> key when the message-" Press F6 if you need to install a third party SCSI or RAID driver" displays.

3. When the Windows XP/2000/2003 Setup screen appears, press "S" to specify additional device(s).

4. Insert the driver diskette-"Intel AA RAID XP/2000/2003 Driver for ICH9R into Drive A: and press the <Enter> key.

5. Choose the Intel(R) ICH9R *SATA RAID Controller* from the list indicated in the XP/2000/2003 Setup Screen, and press the <Enter> key.

6. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

7. From the Windows XP/2000/2003 Setup screen, press the <Enter> key. The XP/2000/2003 Setup will automatically load all device files and then, continue the Windows XP/2000/2003 installation.

8. After the Windows XP/2000/2003 OS Installation is completed, the system will automatically reboot.

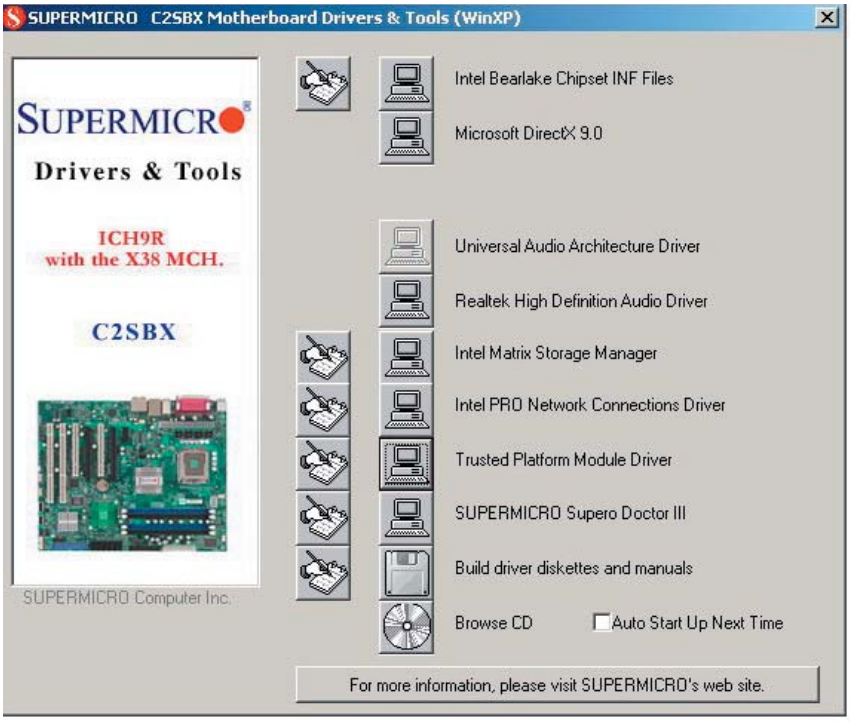
Note: the current version of the ICH9R SATA RAID Utility can only support the Windows XP/2000/2003 Operating System.

Appendix D

Software Installation

D-1 Installing Drivers

After you've installed the Windows Operating System, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these software programs and drivers, click the icons to the right of these items.



Driver/Tool Installation Display Screen

Notes:

1. Click the icons showing a hand writing on the paper to view the readme files for each item. Click a computer icon to the right of an item to install an item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before proceeding with the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

2. To configure ITE RAID settings, please refer to the ITE RAID documentation included in this CD.

D-2 Configuring Supero Doctor III

The Supero Doctor III program is a Web-base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called the SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Note: Both default user name and password are ADMIN.

Note: In a Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

Supero Doctor III Interface Display Screen-I (Health Information)

Supero Doctor III Interface Display Screen-II (Remote Control)

Note: SD III Software Revision 1.0 can be downloaded from our Web site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we will still recommend that you use Supero Doctor II.

Notes

Appendix E

System Specifications

Processors
Two Intel Core2 Extreme, Duo or Quad processors

Note: Please refer to our web site for a complete listing of supported processors.

Chipset
Intel X38 + ICH9R

BIOS
16 Mb Phoenix® BIOS

Memory Capacity
Four DIMM sockets supporting up to 8 GB of unbuffered, non-ECC DDR3-1333/1066/800 SDRAM

Note: See the memory section in Chapter 5 for details.

SATA Controller
Intel on-chip controller for 3 Gb/s Serial ATA (RAID 0, 1, 5 and 10 support)

Drive Bays
Four (4) hot-swap drive bays to house four (4) standard SATA drives

Expansion Slots
Supports the use of seven standard size PCI add-on cards: two PXI-E 2.0 x16 slots, one PCI-E x1 slot, two PCI-X 133 MHz slots and two PCI slots.

Serverboard
C2SBX (proprietary ATX form factor)
Dimensions: 12" x 9.6" (305 x 244 mm)

Chassis
SC733TQ-465 (Mid-tower)
Dimensions: (WxHxD) 7 x 16.8 x 20.9 in. (178 x 427 x 531 mm)

Weight
Gross (Bare Bone): 43 lbs. (19.5 kg.)

System Cooling
Six (6) paired sets of 4-cm counter-rotating cooling fans (fan speed controlled by BIOS setting)

System Input Requirements
AC Input Voltage: 100-240 VAC
Rated Input Current: 6A (115V) to 3A (240V)
Rated Input Frequency: 50/60 Hz

Power Supply
Rated Output Power: 465W (Part# PWS-465-PQ)
Rated Output Voltages: +3.3V (15A), +5V (20A), +12V (35A), -12V (0.5A), +5Vsb (3A)

BTU Rating
1994 BTUs/hr (for rated output power of 465 W)

Operating Environment
Operating Temperature: 10º to 35º C (50º to 95º F)
Non-Operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-Operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance
Electromagnetic Emissions:
FCC Class B, EN 55022 Class B, EN 61000-3-2/-3-3, CISPR 22 Class B

Electromagnetic Immunity:
EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4,
EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety:
EN 60950/IEC 60950-Compliant
UL Listed (USA)
CUL Listed (Canada)
TUV Certified (Germany)
CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials:
This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

Notes